

A large, stylized letter 'A' in blue and black, positioned on the left side of the cover, partially overlapping the title 'Archive'.

July 1991

Vol. 4 N° 10

Price £2.00

# Archive

*The Subscription Magazine for Archimedes Users*

A large, stylized letter 'E' in blue, positioned on the left side of the cover, partially overlapping the article titles.

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Using FontEd

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Logo & Algebra


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Developing a RISC-OS Utility – 2

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Graphics Galore on the Cheap

*Reviews:* The Public Key Issue 2, Prism,  
MiG29 Flight Simulator, VoiceBuilder, !Calc,  
Concept Designer, Protext 5.

A solid blue horizontal bar at the bottom of the page.

## Another new Archimedes?

Rumours are continuing to grow of an impending launch of a major new product from Fulbourn Road. However, Acorn are so tight in their security about new computers (quite rightly) that all I have been able to find out for certain is that the new machine(s) can read 1.44Mbyte PC format discs. (Wow! What startling news!!!) Sorry I can't tell you any more but as soon as I find out anything more definite, I'll let you know. Watch this space.....

### Happy holiday!

Despite the fact that it's July already and I've only had my shorts on one day so far this "summer", it is the holiday season. In the four years of the life of Archive, we've never had more than a week's holiday at a time. (Big "Ahhh!" for Paul!) We wanted to visit our friends in North Carolina but felt we couldn't afford the time... but then came Impression II. What we are hoping to do is get the August Archive finished in the next three weeks (contributors, please send your articles in *as soon as possible!*), dash over to the States for three weeks, dash back and try to get the September issue out as quickly as we can... but it might be a bit late. Please bear with us. Oh, and please be patient with Adrian and Ali as they hold the fort while I'm away. Thanks very much.

Hope you have a good holiday, too!



## Government Health Warning – Beware of flabby Christians!

Those of you living in the U.K. get a very distorted view of Christianity. Why? Well, it would be easy to blame the media for the caricature they present of vicars with funny sing-song voices or ladies in big flowery hats singing boring hymns. But that view is based, unfortunately, on an element of truth.

The church in this country is flabby! It contains many people (though, thankfully, the proportion is decreasing) for whom Christianity is just a chance to dress up in fine clothes and parade around showing people how religious they are. They think that going to church makes you a Christian. Rubbish! It's not surprising that people reject what I call "Churchianity".

The church also, sadly, contains a number of people for whom Christianity is a social circle with mildly altruistic aims – a bit like a religious version of the Round Table – "doing good to the poor" and all that. They think that makes them a Christian. Rubbish! That's not true Christianity either – it's what I call "Dogoodianity".

Don't get me wrong, I think Christians *should* get together (notice that I didn't say "go to church") to worship God – I really enjoy going to church on Sunday. Mind you, the church I go to isn't your *average* Church of England church! I do enjoy church social activities – there are some lovely people who go to our church and I enjoy spending time with them. We do try to go around helping people – locally, nationally and internationally. But none of these things makes me a Christian.

Anyone can be negative but what *is* true Christianity? It's nothing less than a life-changing experience of meeting with the Living God. Sounds radical! It is. You may not feel that your life need changing but that's because, in this country, we lead such "comfortable" lives.

I could take you to some countries (which I cannot name because copies of this magazine go there) where to become a Christian and to say so openly would mean you would lose your job and be rejected by your own family. Also, if you tried to share your new-found joy with others, you could find yourself in prison. People are, today, being hanged for trying to share their Christian beliefs. I tell you, there are no flabby Christians in those countries!

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# Archive

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## Products Available

- **A4 paper trays** – We can now get hold of spare A4 paper trays for the Laser Direct (Qume) at £66, the Laser Direct Hi-Res (Canon LBP8) at £54 and the Canon LBP4 at £57. It makes life much easier not to have to keep taking headed note paper and plain paper in and out of paper trays – just pull out one tray and replace it with another. This includes putting A5 paper in an A4 paper tray which is explained in the Hints & Tips on page 8.
- **A4 flatbed scanner GT-4000** – Clares have produced an interface and software support to run an Epson GT4000 from an Archimedes computer. The main features are: 50 to 400 d.p.i., 24 bit colour, 256 grey scales, max size 214 x 295 mm, uses serial and bi-directional Centronics interface, full RISC-OS application. The prices are £1799 +VAT for the full system or £715 + VAT for the software and interface board if you already have the GT4000 scanner. (£1955 and £660 respectively through Archive.)
- **A3000 Special Access** – Acorn are now providing a package based on the A3000 with Special Needs users in mind. It consists of an A3000 upgraded with serial port and Morley User/Analogue ports, a disc of utilities to facilitate access to the computer for physically disabled users and people with visual impairment, Special Needs overview booklet and a copy of the Special Needs Computing Handbook. You can buy it without a monitor (£679 +VAT) or with an Acorn monitor and a PRES stand (which allows the computer to move about independently of the stand) for £899 +VAT. There is a special price for registered charities or those who are registered disabled – £695 and £953.50 respectively including VAT. Applications forms for these special prices should be available for your local dealer – Archive also has forms and can supply these SA packs.
- **Arc Recorder** – Oak Solutions have produced a very cheap system for sound sampling (£29.95 +VAT or £33 through Archive). It consists of a hand held condenser microphone linked to the computer via the printer port(!) and software that generates samples in Armadeus file format. It is also designed to link in with Genesis II and comes with a support module to allow samples to be used within Genesis applications.
- **ARCTiculate** – The current spate of Archimedes speech generators continues.. 4th Dimension have produced an “animated speech synthesiser” which includes, as well as voices, four faces that speak the words! It can read text files and word processor documents and can be used within your own programs. £24.95 from 4th Dimension or £23 through Archive.
- **ARM3 price drop** – There seems to be a bit of price war going on with ARM3's and so we've been able to bring down the price of the Aleph One ARM3 to £420 inc VAT.
- **Careware N°13** – We have put Jonathan Marten's improved Draw program, !DrawPlus which was reviewed last month, page 19, as the major item on Careware 13. We have made it a DTP type disc by adding the latest versions of !CGM →Draw (v2.1) and !Translator (v6.45) and two utilities to convert the other way: !DrwCgm (v1.0) which converts Draw files to CGM files and !Creator (v1.13) which converts sprite files into GIF, TIFF, AIM, PBM files. There is also some Draw clip art: under the heading of biology are 4 week old & 8 week old embryos, digestive system, ear, paramecium, respiratory system, resuscitation, teeth; under the heading of people are cobbler, eskimo, footballer, girl reading, girl riding, magician, painter, singer; and then the rest... bed and breakfast, house, King George V battleship, long ship, Pink Panther, snowman, tree.
- **ClassROM** is a new networking product from Oak Solutions. Anyone trying to run an Econet system with Archimedes computers will realise the problem of a class full of pupils trying to load, say, Impression all at the same time. Oak Solutions' solution(!) is to provide a box to attach to each, or as many as possible, of the Archimedes on the network. This box looks, to the user, like a read-only ROM. In fact, it is a 20M (or bigger if you prefer!) SCSI hard drive which can only be



read by them but which can be written to, via the Econet, using special software which, presumably, only the network manager would have access to. You can use this software to put whatever files and applications you want onto whichever stations you want. So, while the kids are out of the way, you could load up various applications onto different stations so that they would be ready at the start of the day for the pupils to use. The pupils would save their data either on their own floppies or via the Econet on the file-server. There is no limit to the number of stations on the network that can have a ClassROM installed and so as you expand (well, as money becomes available) you could add ClassROM's to more and more of the Archimedes so that fewer stations would have to load their applications via the network. Prices are £150 (+VAT) for the management software plus £344 for each 20M classROM unit or £445 for the 45M version. Archive prices (inc VAT) are £160, £375 and £485 respectively.

• **Creator** – Alpine Software have produced a program to enable you to create your own arcade game. It comes with an object designer, a screen designer, a path designer, an event manager and a run-time system. You also get a collection of sprites and sound samples to incorporate in your own games. The price is £38.95 from Alpine Software or £36 through Archive.

• **Digital Storage Oscilloscope** – Armadillo Systems Ltd have produced a digital storage oscilloscope using the Archimedes to do the capture, processing and display of the data. It comes in single and dual input formats priced at £323.10 and £445.50 +VAT respectively. The inputs are 1Mohm, 30 pF, 30MHz, 5V to 10mV with a resolution of 256 steps on channel 1 and 128 on channel 2. This system makes good use of the processing power of the Archimedes to give a range of ways of interpreting and displaying the data collected.

• **Fine Racer** – Race your buggy around various circuits avoiding various obstacles, picking up various bonus points which can be converted into things to upgrade your car provided you come in the first three in the race itself. Oh, and watch out for Mad Max who drives like a maniac. Produced

by Eterna in France and marketed in this country by Vector Services. Price £19.95 inc VAT.

• **Imagine** is *not* just another art pack – Topologika refer to their new product as a design pack because it has applications right across the curriculum. It has a twin-screen facility and built-in maths facilities and an on-line help facility. The price is £39.95 inc VAT or £37 through Archive. Separately available are packs of images for £9.95 +VAT each including Pirates, Victorians and Romans.

• **Impression Business Supplement** – Computer Concepts have produced a set of utilities which make Impression II into a powerful business/professional DTP system. The supplement includes Expression-PS (also available separately), a mail-merge utility, a sort utility for use with the merge program plus four loader modules: RTF (as used with Microsoft Word on PC and Mac), WordPerfect, PipeDream and WordStar. The price is £49 +VAT or £53 through Archive.

• **Mig29** – a new flight simulator from the originators of Interdictor – SIMIS. For full details of this, see the review on page 24. The price is £40.85 inc VAT or £38 through Archive.

• **New PC Emulator is (almost!) here!** – A press release of 19/6/91 confidently predicted the release of the new PC Emulator on 21st June. It's not *actually* available yet as I write (2/7/91) but it should be in "about three weeks". Version 1.6 of the emulator allows you to return to your desktop and find it intact and, on machines with 2M or more, it can run concurrently with RISC-OS within the multi-tasking environment. DOS files can be accessed directly from RISC-OS and it provides "full CD-ROM support via CDFS and MSCD extensions". It is supplied with MS-DOS 3.3 including a mouse driver and has an emulation of the Intel 8087 maths co-processor which increases floating point calculations by a factor of fourteen. The emulator runs in CGA, EGA or MDA graphics modes with partial support for VGA for software, such as Windows 3, which accesses the video hardware directly. The price is the same as the old emulator, £99 plus VAT or £96 through Archive, and there is an upgrade for existing users for £29 (+VAT presumably) and as

soon as we know how you can get the upgrade, we will let you know. (I suggest you check the back of the Price List which is printed later than the magazine itself.) (See the screenshot below.)

- **PrimeArt** is Minerva's new 256 colour art package aimed at primary and special needs children. Amongst other things, it allows sprites to be pasted into a picture, has tailorable menus and allows text of any available font to be used. The cost is £79.95 +VAT or £87 through Archive.

- **Removable drive prices down again** – This time it's the Atomwide removable drive with the high power fans – they are now down to £555 inc VAT or £755 with an Oak podule.

- **Rhapsody II** is available now for £61.95 inc VAT (or £57 through Archive) and there is an upgrade through Clares for £15.50 inc VAT – just send the original disc back (not the packing) to Clares. The main extra features of Rhapsody II are: drag notes from panels onto the score, MIDI thru and MIDI beat added, multiple MIDI ports supported, MIDI program changes possible within the score, capture notes in step time directly onto stave, octave transposition, transcribe trip-

lets, block re-tail, improved sprites for better printout, formatted scores can be exported in Draw format to a new program called ScoreDraw which will allow professional quality printouts. (ScoreDraw will be available "later this year".)

- **Swedish Impression** – If you want a Swedish version of Impression 2.1, contact Information Technology Services, Sjöfullsg. 3, 602 27 Norrköping, Sweden (11–127758, fax 11–126545). Most programs on the Applications Discs are also available in Swedish, as is PipeDream 3.

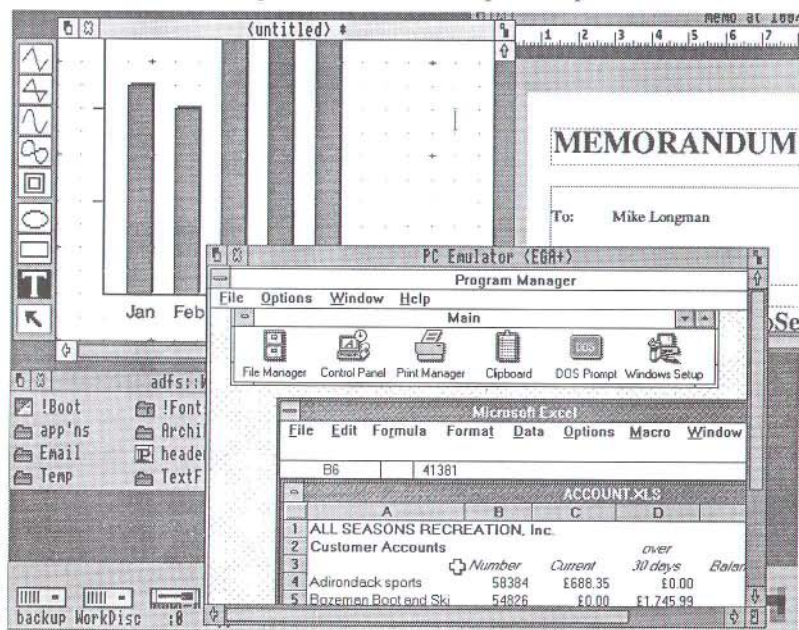
- **Wonderland** is an impressive new adventure game occupying four floppies (which can be loaded onto hard disc). It is based on Alice in Wonderland and runs in its own (non-RISC-OS) window environment. It costs £32 through Archive.

- **UltraSonic Sound System** – Alpine Software claim this to be the *only* fully RISC-OS compliant, multi-tasking sound and music system. It produces music files that are compatible with Creator, their new Arcade Games Designer – see overleaf. It comes with an application to convert samples from various formats as well as Sound-

tracker files into its own format. It also comes with a PD playback application to play UltraSonic files and a disc of almost 150 sampled instrument sounds. The price is £30 from Alpine Software or £28 through Archive.

## Review software received...

We have received review copies of the following software and hardware: Fine Racer, Animynd Life, DrawAid, House of Numbers, UltraSonic. **A**



PC Windows 3 in a RISC-OS window on the new PC-Emulator



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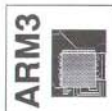
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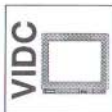
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## Hints and Tips

• **\*Count command** – In Archive 4.6 p8 the hint about \*Count, is only partly right. The \*Count command only counts data. This means that directories indeed don't contribute, but also that only the amount of data in a file is counted. However, all files must be an integer multiple of the block-size (1k for D and E format), and for short files this makes a huge difference. My 46Mb hard disc has about 8Mb difference between space used from \*Free and from \*Count for these reasons!

One implication of this is that when you archive a large number of small files with !Spark you can save much more disc space than you might expect. One thing I would suggest for hard disc users is to copy the directory tree using \*Copy :4.\$ :0 T R, and then archive it, which will compress it down to almost nothing. Think of all the time you spend setting up the directory structure; this may be more important than losing files, most of which you will (should?), after all, have on floppies. As an added bonus this also gives you the location of all applications, as these are just directories. If (perish the thought) you have a disc crash, you can just drag the tree out of the archive and onto a new hard disc. Stephen Burke, Liverpool.

• **DataLoad problems?** – The PRM says that if a DataLoad message isn't acknowledged, the sending task should delete <Wimp\$Scrap> and give an error. However, I think this is wrong. You aren't guaranteed that the scrap file used is, in fact, <Wimp\$Scrap>. One case where this must happen is with an application which can both load and save files of the same type at the same time; it must not use <Wimp\$Scrap> for both, or it might get very confused! However, there might be other reasons. I therefore think you should remember the name of the file you saved, and delete that – you get told that it wasn't a secure file, so this should be safe. Stephen Burke, Liverpool.

• **Hard Drive problems** – BEWARE!!! If you have a fairly old computer – a 310 or a 440 or

even a vintage 410/1 or if you are working in a dusty environment and you are putting in a new hard drive, *check/replace the fan filter*. Why? Well, drive suppliers tell us that on more than one occasion they have had a computer where the fan filter was blocked up with dust, the customer has installed a new drive and not changed the filter and, as a result of the lack of airflow, the drive has suffered a fatal head crash. So, you have been warned. (Fan filters should be available “from your local Acorn dealer” or they can be bought from N.C.S. as part of an “Annual Service Kit” – including a new pair of batteries – priced £3.)

• **How long is a line?** – While editing an old program which I was converting from the BBC Master to run on the Archimedes, I came across some features of Basic line lengths which may be of interest. The program was originally written for the BBC-B with the longest possible lines to save space.

On Page 16 of the 'Basic User Guide' issue 1 dated 1988, it says 'A line of Basic can contain up to 238 characters...' but on page 386 it says that 'As in a Basic program, the length of a line is limited (by the Basic Editor) to 251 characters..'. This implies that the system has two different ideas of what the maximum line length should be, instead of one. Unfortunately, the one it uses seems to depend on what you are doing.

My module ARMBasicEdit (version 1 21 August 87) allows the insertion of many more than 238 characters in a line. I can get up to 369 before there is a warning bell, but then neither <Escape> nor <Return> nor SAVE work until there are only the 251 characters left. Programs containing lines of length between 239 and 251 apparently run without problems. However, if you try editing the lines with Basic loaded, just using the Copy key, you find that there is a warning bell after 239 characters, (excluding the line number), not after 251.

Programs with lines longer than 239 characters can be converted to ASCII using \*SPOOL. However, when you attempt to read them back into a



Basic program using \*EXEC, the lines are truncated to 239, so that the program no longer runs. There is a warning bell but the \*EXEC process does not stop, so not allowing me to find which lines are at fault. I find this very frustrating. The file Btest, on the monthly disc, is an example of such a program. The file 'CHECK240' is a small program which reads a file made using \*SPOOL which cannot be successfully read back using \*EXEC. It lists the line numbers which are too long, allowing me to edit them with the Basic Editor.

CHAIN "Btest" to see that it runs. Then try

```
*SPOOL TEMP
```

```
LIST
```

```
*SPOOL
```

```
*EXEC TEMP
```

```
CHAIN "CHECK240"
```

and reply "TEMP" at the prompt. Kate Crennell, Didcot.

- **Printer drivers** – Further to recent tips about altering the PrData file within the printer driver, you can also alter the title of your preferred driver and make it the default driver on loading. For example, the amendments to !PrinterDM in Archive 4.8 could be made to read "Star LC24-10" by altering the line before the line "printer number:2". The default loading is achieved by amending the line "printer:01" to "printer:02". This line is found towards the end of the data file immediately before the line "location:1". Note that the printer number must be padded out with a zero (0). Pressing <select> after loading the driver will confirm if your amendments have been correctly made. Ted Lacey, Southampton.

- **Printing A5 on an A4 printer** – If you ask the manufacturers, they say it is not possible to put A5 paper through either the Qume (300 d.p.i.) or the Canon (600 d.p.i.) Laser Directs – or the LBP4's for that matter – but it is possible. All you need is a pile of A5 sheets of scrap paper sello-taped up into a solid block about ½" thick (or ¾" thick for the Canons). You put them at the back of the A4 paper tray and put the A5 paper, sideways, of course, at the front. The paper usually

goes through OK but does occasionally stick. All you have to be careful of, presumably, is that you don't print on the lower half of the (A4) paper that is not actually there. Having said that, I have been using A5 paper on Qume's, Canons and Mac Laserwriters for years and have occasionally left the "A5" tray in when printing A4 without any obvious damage to the printers.

We can now get hold of spare paper trays for Qume (£66) and Canon LBP4 (£57) and Canon LBP8 (£54)

(A possible alternative to the paper is a block of wood the same size and thickness but I haven't actually tried it.)

- **Psychedelic sound-to-light** – Whilst playing a Tracker module, it is possible to obtain some interesting effects on your monitor by typing the following Basic command:

```
SYS "OS_UpdateMEMC",768,1792
```

The screen can be returned to normal with either a MODE command or with:

```
SYS "OS_UpdateMEMC",1536,1792
```

Rob Swain, Kent

- **Render Bender on SCSI hard disc drives revisited** – In Archive 3.11 p6, Neil Berry explains how to use Render Bender on SCSI hard disc drives but leaves us with the problem of how to use \*KILLADFS. This can be achieved by changing all references made to SWI ADFS\_Drives (&40242) to SWI SCSI\_Drives (&403C6). i.e.

In the 'Render' Basic listing: change the SWI &40242 to &403C6 in line 15810

In 'Aniroute' Basic listing: change the SWI &40242 to &403C6 in line 6670

Atle Mjelde Bårdholt, Norway

- **Running one application inside another** – The comment in Archive 4.9 page 6 seems to need some amplification. As explained on page 11 of the May/June 1991 issue of "The Archimedeian" from Computer Concepts, if you want to run one application from inside the !Run file of another, you should first enter the command

```
*Desktop Run <sibling task name>
```

and then repeat the \*Wimplot command from



earlier in the !Run file to ensure that there is enough memory available for the main application before you run it.

Thus, for example, to make Impression automatically load a printer driver whenever it is run you should edit the !Impress.!Run file by inserting two extra lines immediately before the last so that the last three lines read:

```
Desktop Run [...path...].!PrinterXX
Wimpslot -min xxxK -max xxxK
```

```
Run "<Impression$Dir>.!RunImage" %*0
```

The xxxK in the Wimpslot command should be exactly the same as used earlier in the !Run file – the precise amount of memory needed will vary from one version of Impression to another. Hugh Eagle, Horsham.

• **Sound improvements** – A much improved sound, which is also more controllable, can be obtained using the standard colour monitor supplied with the Archimedes. A 3.5mm jack (Archimedes) to phono (monitor) cable is required, and the speaker on the Archimedes should be turned off using \*SPEAKER OFF. Sean Kelly, London

• **Sound voice changes** – Among the (many) things that annoy me are those professional programmers who alter your Sound Voice for their games which otherwise claim to be "RISC-OS Compatible". They return you to the desktop with *their* Sound Modules set up as ChannelVoice 1. Not everyone likes the WaveSynth-Beep as default voice, and as for some of the sound modules or digitised Voice Modules which are then sounded when an error occurs, YUK!

It is quite a simple matter to find out what ChannelVoice the user has set up and the program could very easily, before exiting to the desktop, restore it using the following code which is available for all programmers to use, professional or amateur (please!).

```
REM Find the User's ChannelVoice 1
SYS "Sound_AttachVoice",1,0 to
                                ,user_voice%
```

```
REM Because ChannelVoice 1 now equal
                                to 0, reset
```

```
SYS "Sound_AttachVoice",1,user_voice%
REM Rest of program, Wimp Interface,
                                whatever
*ChannelVoice 1 Totally Fantastic
                                Voice
```

```
REM Program at end, restore user
                                voice
SYS "Sound_AttachVoice",1,user_voice%
```

David Shepherdson

• **Toolkit Plus update** – Clares' Toolkit Plus usually produces a 'Bad disc address' error when you try to edit E format floppy discs. This can be rectified by performing the following:

- 1 RMLoad the Toolkit Plus module.
  - 2 Type: \*Modules <return> and take note of the 'position' address of the Toolkit Plus module.
  - 3 Use \*WFIND &EF060240 <return> and ignore the first occurrence (i.e. press <ctrl-tab> to go on to the next occurrence).
  - 4 Locate the instruction seventeen lines down which reads BCC xxxxxx.
  - 5 Select 'word mode' and zero this instruction.
- You should now be able to edit E format discs.

S Edwards, Wordsley

• **Toolkit Plus with SCSI** – Clares' Toolkit Plus provides a disc sector editor, which refused to work on my SCSI hard disc. A modified Toolkit Plus may be produced by using !Edit on the Toolkit Plus module to replace all occurrences of 'ADFS' with 'SCSI' before saving the module with a new name e.g. SCSSITools.

A drawback is that the modified version will not cope with ADFS floppies. Changing the module name (e.g. from 'Toolkit+' to 'SCSSITools') using !Edit allows the modified and original modules to be present at the same time, and changing the disc edit command names allows both ADFS and SCSI discs to be edited – for instance, !Edit could be used to replace 'AEDIT' in Toolkit+ with 'WEDIT' in SCSSITools.

Sean Kelly, London

## Impression Hints and Tips

• **Abbreviations** – I use abbreviations quite a lot such as “imp” for Impression and just “r” for Archimedes but I often want to say, for example “...using DrawPlus (Careware 13)...” and although “ca” and “Ca” are both set up to expand to “Careware”, using “(ca)” doesn’t work. There is no easy way round it as far as I know – you just have to put “(ca)” into the abbreviations dictionary to expand to “(Careware)”.

• **Bullets** – We’ve mentioned that <ctrl-shift-H> produces a bullet but since <backspace> (immediately below <F12> and above <V>) produces the same ASCII code as <ctrl-H>, you will find that <shift-backspace> produces a bullet. Touch typists may well find it somewhat more natural than <ctrl-shift-H>.

• **Creating tables** – The release notes issued with Impression II describe the new features of version 2.12 but they do less than justice to one of those features, namely the capacity to create tables. It is possible to vary the width of individual columns and individual rows in a table as well as the thickness of the vertical and horizontal lines which form the table.

In addition, the many editing facilities of Impression can be used to modify text which has been entered into the table so that the style and size of the characters in any “cell” of the table can be varied as desired.

Moreover, in the manner usual with Impression II, another frame can be superimposed on any selected part of the table with the effect that lines of the table can be covered and will “disappear” permitting text of any size and nature to be introduced and adjusted to appear to be a part of the structure of the table.

In addition to text, any of the

superimposed frames can be made graphics frames permitting illustrations to be introduced. You can use left hand tabulation in the some columns, right hand tabulation in others and decimal point tabulation in others.

Practical matters: First construct the empty table. Then determine which cells will be visible in the completed table and enter text into those cells. Finally, superimpose other frames as required. Proceeding in this order prevents interference with tabulation.

The usual procedure will be to construct a table of this kind within a frame of its own so that it can be moved as a whole to any desired position within the document of which it will form a part. Therefore, on completion of the table, the various frames of which it is composed should be Grouped so that the table occupies a single frame.

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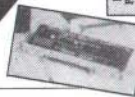
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# Graphics Galore on the Cheap!

## Tord Eriksson

Reading with amazement about the latest version of Ventura Publisher Mac that costs a cool £695 (exclusive VAT!) and so-called 'budget' DTP programs for IBMs weighing in at £70 to £160, I wonder if we Archimedes users really know how fortunate we are when it comes to good, cheap software.

The "budget" DTP programs for IBMs can't even word-process – you have to use a separate editor, just as you have to do if you do some DTP with !Draw....

Of course, the latest version of Ventura Publisher Mac can print fonts in 23½ size instead of just 23 or 24 point size – a revolution no doubt but one that almost all DTP and word-processors for our Archimedes machines manage easily!

### Archimedes – no master of colours!

There is a difference between modern IBMs and Mac II's that puts all Acorn computers at a disadvantage, even if it was once hailed as an advance over said computers: Colours!

In terms of colour, both Mac II computers and IBMs with VGA are better than Archimedes and the sky is the limit as there are hundreds of graphics cards that can be bought that improve things further – 24-bit colours are available.

RISC-OS has an upper limit of 8 bits per pixel, 256 colours – 24 bits per pixel gives 16,777,216 different colours, quite a lot more!.

For the Archimedes range, the limitations are built-in, through RISC-OS and the fixed hardware. (There are some improvements possible with hardware add-ons, but nothing major).

### Serious DTP is black & white!

Fortunately, colour printers are very rare in everyday printing, mainly due to the fact that such printers are very costly and/or requires skilled staff to attend to them.

So, for practical purposes, DTP will continue to be a mainly black & white affair, maybe with some colour thrown in for good measure on covers etc.

## The woes of illustrating....

Being a former technical illustrator, I am painfully aware of the amount of work needed to set text in a circular fashion as on a coin or an official seal or make the logo on a fluttering flag look like the real thing. Hours and hours of work, or in the case of the flag, take a photo of the real thing and trace that with tracing paper....

If the logo is new, you can't print it first on a flag, so you try to make do with crinkling a piece of paper upon which you put your text or logo and take a photo of that....

All this is now of the past, as long as your logo or text can be transformed into a !Draw file.

### First – !FontFX

Let us try an example: There used to be an oil company around this part of the world called Caltex. Let us say we are going to do a drawing with a flag fluttering with that name on it.

First we have the text, set in Pembroke:

**Caltex**

To make it more interesting let's add a shadow, with the shadow in the north-east, and make the text itself a black outline filled with a light grey and behind it, the dark grey shadow:

**Caltex**

Both these operations are very easy to do with !FontFX as you just click on the buttons needed, no previous know-how needed!

To make this flutter we have to use a couple of other utilities: !DrawPlus (or !Draw) and DrawBender.

### Warped universe

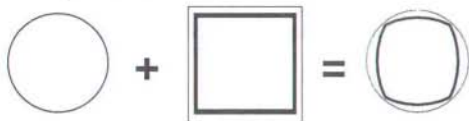
A normal picture is plotted in our brain according to the angle we watch the picture from: If we fly above a square field the corners are right angle corners (a so-called bird's-eye view) and if we stand just outside the field the angles get very odd indeed – their sum is still 360, though!



If a square is wrapped around a cylinder things get much more complicated, especially when seen at an angle – an illustrator's nightmare! Not even all CAD programs seems to be able to solve it correctly....

### Secondly – make a mould!

DrawBender manipulates !Draw files by plotting them inside each other: Any text that is going to be manipulated has to be in !Draw format. The coordinate system "inside" a square is still square but inside a circle it takes on the characteristics of a text printed on a balloon like this:



The first (the circle) is called the mould and the second (the square inside a frame) is called the object.

Due to the way DrawBender works, a real circle couldn't be used – it had to be substituted it with a 32-sided polygon and it had to be flipped over because paths have to be clockwise to work as moulds in DrawBender whereas !Draw and !DrawPlus draw counter-clockwise – it's all very well explained in the DrawBender manual!

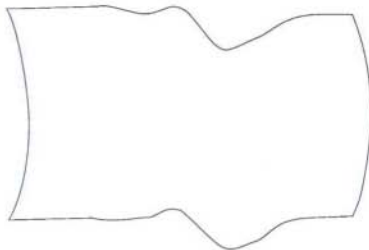
### Wonderful results!

Taking the text, we put it on rectangular back-

ground, to make the outline of the flag as the outline of the mould doesn't show up on the finished result:



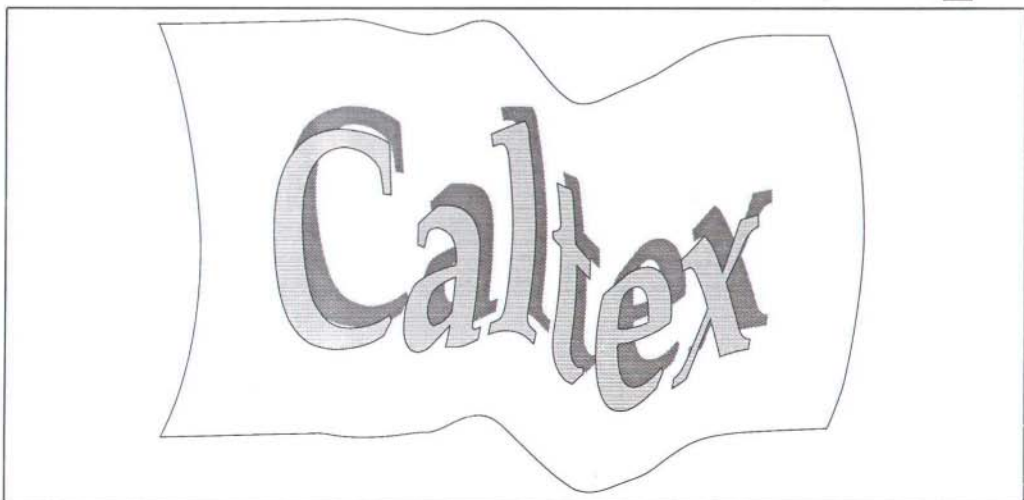
This is now our object! A "flapping flag" is our mould:



### Conclusion

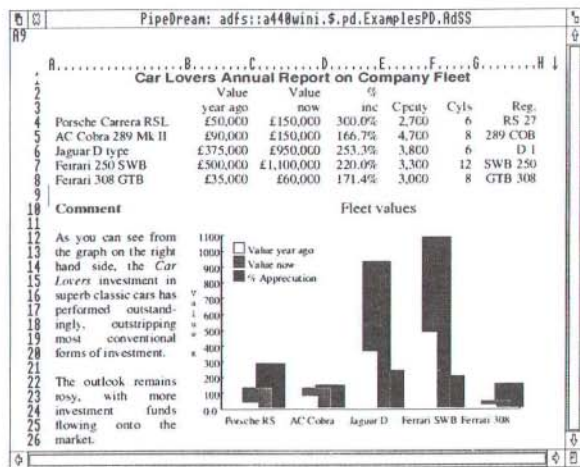
As the end result shows the effect is quite stunning. This amount of manipulation is available to IBM users of course – I could recommend Express Publisher (£159.95) as the "low-cost" alternative!

For Archimedes users the cost is just £21, including two manuals and lots of sample files (available from Ian Copestake Software). **A**





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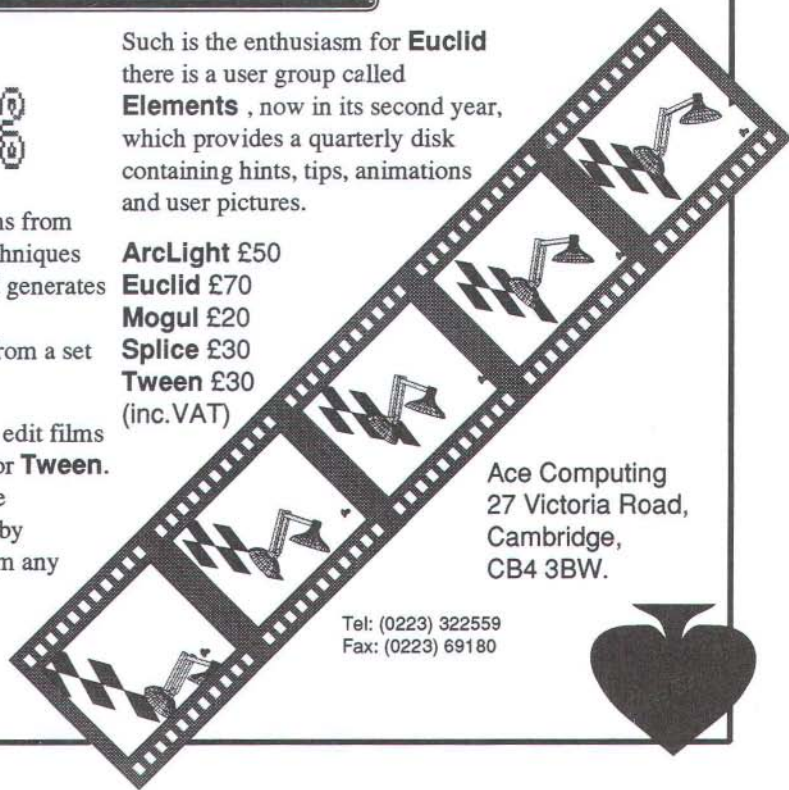
**Splice** allows you to edit films produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

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## Comment Column

• **Acorn's "look and feel"** – Software for a computer like the Archimedes has to be developed in accordance with a certain set of rules so that the same operations (like saving a file or searching a string) can be performed in the same way in every program; however, to become acceptable to all those different programmers, the guidelines have to be selected very carefully and this, in my opinion, Acorn has failed to do!

When I bought my new Archimedes at the end of 1990, it came equipped with Impression, so that I got acquainted simultaneously with the different ways of handling text which are used in Edit and in Impression.

As Impression was quite new, whereas the version of Edit on my application disc was already one year old, I took it for granted that the much more efficient methods used in Impression constituted the new accepted style which would also appear in new versions of Edit.

For those not acquainted with Impression (or Ovation): What I am writing about is, most of all, the way in which selected areas are used as a kind of giant caret – effects like a new font appear either from the current cursor position onwards or, if a selection was made, in the selected region; new text is inserted either at the cursor position or in the place of the selected text, which vanishes to the clipboard; if you wish to select a large text area, you can position the caret at one end, then use the scroll bar to find the other end, where you click adjust – the caret has stayed where it was.

Now I have read with dismay that, on the contrary, Acorn in their new guidelines for programmers have still upheld the style used in Edit as compulsory – and that's a shame!

What I will do is write a letter to Acorn urging them to reconsider and I very much hope that all those who agree with me that Impression (and to a lesser extent also Ovation) employs methods far superior to those found in Edit, will do the same. (In the words of the old Hudson Bay Company: If you like it, tell the Queen; if you don't, tell us!)

Jochen Konietzko, Koeln, Germany

• **Arcscan III** – I was pleased to see a review of ArcScan III in Archive 4.8; and particularly pleased that what your reviewer called his "first niggle" turned out to be his only adverse comment about the package.

The feature which niggled your reviewer also niggled me for the same reasons. In response to your comments, version 6.1 (released in May) has a new "Save finds" option which allows you to drag a text icon to a printer driver icon for print-out of your finds under full control of the Acorn drivers, with all the advantages which this confers. Alternatively, you can drag the icon to a directory viewer to save your finds for subsequent use or for editing as required.

Since the last version of ArcScan which you reviewed (0.5) was released in Nov/Dec last year, a number of other enhancements have also been made to the package in response to feedback from its wide user base, including an extended wildcard option. Additionally, there is now an ArcScan Library Disc containing data from Acorn User and Micro User from 1987 (the year of the Archimedes) to the present. This will be updated on a regular basis.

By the way, your reviewer did not mention the price of ArcScan. It costs £18 from Norwich Computer Services. Lee Calcraft, Beebug Ltd.

*If you want to upgrade to version 6.1, send your master disc with a covering letter either to Lee or to the Magazine Department who will, I gather, be pleased to upgrade it for you free of charge. In case you were wondering, that's not a typographical error, Lee has developed Arcscan III from version 0.5 to version 6.1 in just six months.*

• **ArcScan III again** – I enjoyed Eric Ayers' article on ArcScan III (Archive 4.8 p 21) because I too have been frustrated by some of its features, and I should like to share my experiences with your readers. I agree with Eric that despite the poor operation of the PRINT command, it is a very useful program. Early versions of ArcScan III had a problem with the printer driver when used with some printers, e.g my Taxan Kaga

KP810. Although ArcScan II printed, ArcScan III claimed the printer was not online! The latest version, (number 0.52 dated 20 Feb 1991) has cured this problem for me.

Enhancements I should like to see are:

1. Better handling of punctuation, preferably ignoring it all. My experiments show that the current version of ArcScan III ignores both "." and "," as word separators but not ";" or "'".

2. Selective printing of the results of a search in a multi-tasking manner, (as requested by Eric), and easier options to leave the selected entries in a file. (*See above!*)

3. An option to set the printer line length. This is currently set to 40, the number of characters visible on the screen. This wastes half the paper on most printers which can easily take 80.

4. Allowing the search to continue over multiple databases, e.g. to search both RISC User and the Acorn manuals for all occurrences of a string such as 'FormEd'. This would be even more useful now that some Acorn and Micro User bibliographies are available. (See Risc User May 1991 for details of entries since 1987.)

5. Allow repeated searches, with new search strings which operate only on the previously selected entries. This might be done by making new temporary databases in files with an option to delete or keep the files on exit of the program. This would make it easier to make our own special interest databases.

6. Restriction of the search to particular article types, this was a 'MagScan' feature lost in the translation to ArcScan. I don't want my search slowed down by looking through hundreds of 'Games' when I only want 'Programming Articles'. Kate Crennell, Didcot.

- **Assembler speed confusion** – In answer to the question in the Archive 4.6 p5 about why removing an instruction from an assembler program can slow it down, basically it's to do with the way memory access is optimised by the ARM and MEMC. The upshot is that you can access four sequential words in memory in five cycles but only if they start on a quad-word boundary (i.e. the address is divisible by 16); otherwise it takes

6 cycles. This can obviously make a big difference in a loop. This also applies to LDM and STM, so the most efficient transfers involve a multiple of four registers, with the base address aligned to a quadword boundary. The magic number of four words was chosen because MEMC holds up DMA requests (e.g. video update) during these fast sequential cycles, and you can't do that for too long. DMA access itself always uses quadword chunks. The ARM doesn't know anything about the four word limit and normally thinks it's doing sequential access all the time; it's MEMC which forces a non-sequential access whenever bits 2 and 3 of the address are zero. Stephen Burke, Liverpool.

- **Clares** – I use Pipedream regularly in my office but, although I find it very efficient, it hasn't got the prettiest of screen displays and is not particularly easy to use for other people in the office who complain about having to use <adjust> to select a box and not being able to only use the cursor keys to move around the sheet so with this in mind I approached Clares about a demonstration copy of Schema.

Clares sent me a full working copy on one month's evaluation and for this I would like to thank them as this is the only real way to test software.

I found the program very easy to use and there was a lot Colton Software could look at to improve Pipedream especially the highlighting of the current cell.

The only reason I couldn't use it was because each sheet took up too much memory and as I need up to 13 sheets in memory at once even 4meg wasn't enough. I recommend that anyone wanting to purchase a spreadsheet give Schema a look.

- **IDE drives from Ian Copestake** – Having had my A3000 for a little over a year now and getting well "into" public domain software and starting to get the hang of RISC-OS and the Wimp, I decided that I would like to have a hard disk, even if it was only to clear a little room and get rid of the piles of floppies that had built up! I took my time and looked at the adverts, compared prices and decided to wait! Then, Ian Copestake advertised a series of hard drives for the A3000 which,



although external, could plug in internally at no extra cost! (Most important) However, I wanted to be able to upgrade easily with anything bought for my A3000. The 20 Mbyte internal was OK, but 20 Mbytes is only 25 "E" format floppy disks, so I looked at a larger drive. Archive were offering 45Mbyte removables for about the same price as Ian was selling 80 Mbyte drives, PLUS if I ever did need further storage, I could simply plug in a second drive for about £400 giving me a massive 160 Mbytes of FAST storage. *(MR45's run at 590 kbytes/second which could hardly be called slow and extra 42M cartridges are only £75 each so we are not really comparing like with like. Ed)* So, I counted up the pennies and rang up. Ian was kindness itself and spent quite a bit of time explaining the ins and outs of the idea of hard disks and the *ideA* interface itself and promised to despatch one as soon as they came off the production line.

Next thing I knew, Risc User did a very negative review of the drive. The end of the month came and so did my drive, VERY well packed. Although I am not a total beginner at fitting expansion boards, I would have preferred a little clearer information on just which board I had. But a few minutes more spent reading the leaflet cleared up which bit went where and which way up, and I had my new drive installed.

Now came the big test – put the cover back on and switch on. Having done so, I was very pleased to find an IDE 4 icon on the icon bar, though to the right of the floppy icon, and clicking on this displayed the hard disk directory with a few files shown – formatter and such like which had to be transferred to floppy as the drive was supplied formatted.

Clicking on the FREE entry on the menu gave me what works out at just under 81.5 Mbytes available. I then spent several hours and had great fun setting up my drive as I wanted it with !System, !Fonts and a !Boot application in the root directory and everything else in directories such as Utilities, Applications and so on. I made a back up at 20 Mbytes and carried on, wiping the disks as I went. (MISTAKE!) I carried on and, by the time the next day dawned, I had over 30 Mbytes

of software on, loads of blank disks ready for the next back up and then, "Broken Directory". What a blow! I was, however, able to get most of the programs off, though I did lose about half a dozen in the end. I salvaged what I could and ran the formatter. I then put the 20 Mbyte backup back on and catalogued the disk and, again, "Broken Directory". I even lost access to the floppy drive at one point.

I rang Ian Copestake who asked me to ring the service department which I did. It turns out they are "just over the hill" from me, so they arranged to pop over that evening and sort me out. They duly came and got me sorted out in short order. Just what was wrong I am unsure, I don't know if the interface board was at fault or if I hadn't worked it into the internal expansion socket correctly or not, but it works perfectly now. Apparently Acorn have not gold-plated the contacts in the A3000 internal expansion and sometimes it does not make full contact.

The gentleman from Baidon Electronics even gave me a copy of a speed test routine. This gives a 21ms access time with 696 kbytes transferred per second. This may be a little slow compared with the A410 or whatever, but the A3000 *ideA* interface is an 8bit as against a 16bit interface as on the bigger machines. Mind you, compared with floppy, it is fantastic!

Anyway, since that evening, just over a month ago, I now have a hard disk with some 47 Mbytes of software on and still quite a bit of space available. Yes, I take regular backups onto 50 odd floppies! In use, I find it a little noisy, but you can configure it to switch itself off after a time using \*IDEPOWERSAVE which helps mute the noise a little, also I have put it on a cork floor tile, which again helps muffle the noise.

Other commands available are \*IDEPROTECT which prevents any writing to the disk, ideal when you first examine a floppy from a new source as any virus cannot access the hard disk! David Shepherdson, Ilkley.

• **PC Emulator** – I read with great interest the article on setting up the PC Emulator written by Richard Wheeler in Archive 4.8 p56. With regard to the speed of the emulation, on an A540 'sub-

jectively' the speed is much improved. In fact, I don't find it much slower than the 386SX PC's that I use at work.

The emulation is very good and I find that most programs will run without problems. I have a Canon LBP-4 Laser Printer which I use with a Laser Direct card, a superb combination. The Canon printer comes with a program called LaserTwin which enables the Canon to emulate a HP LaserJet printer. I installed LaserTwin to run under the PC Emulator on the A540, it worked first time and I enclose a copy of the test printout (*which looked very impressive Ed*). Quite an achievement – an Archimedes pretending to be a PC, running a program which makes a Canon Laser Printer think it is an HP LaserJet!

I should point out though that this runs very slowly – particularly compared with the Laser Direct. However, Laserjets do run rather slowly anyway.

Incidentally, what has happened to the new PC Emulator from Acorn that you mentioned in Archive last July? It was meant to run in a window on RISC-OS, support EGA/VGA graphics and offer a worthwhile increase in speed. Indeed, I even heard that beta test versions were being tested. Why go to the trouble and expense of developing this new version of the Emulator, if it is never going to be released. Michael Lowe, Loughton. (*See the Products Available. Ed.*)

• **Schema** – (Re: Archive 4.9, p 14) With the greatest of respect to Clares, that company really has very little clue as to how spreadsheets are used to do a real job of work in the real world.

The whole point and joy of a spreadsheet is the ability to arrange and re-arrange information, to continually update and modify, to present and represent sets and subsets of that information. In fact, to continually tune the content and presentation of information.

It is positively insulting to suggest that a user "... sets up a badly designed spreadsheet..." and that "... inserting and deleting rows and columns ... is only needed if you make a mistake in the design of your sheet". Balderdash, Clares! Who are you to decide if users are "good" or "bad" designers of spreadsheets. Why can't we change our minds if we wish?

The important point you overlook is that we, the customers, are *users* of spreadsheets. If a particular spreadsheet has an insert or delete feature, or any other feature, it is there to be used and used repeatedly.

Can we, the users, have our (so called) upgrade i.e. de-bugged first useable version, soon please? Michael Green, Sidmouth.

• **Spreadsheet comparisons** – A feather in your caps for being the first Archimedes magazine to realise that no spreadsheet review is complete without a comparison of speeds and sizes of operation of the competing packages. Well done!

The table given in the June issue compared loading, saving and recalculation for Logistix, PipeDream 3 and Schema. Readers may be surprised to find that Logistix came out best for speed and worst for file size. Much of this difference is due to Logistix not being designed for the multi-tasking desktop world. To illustrate this I have added a column to the table for PipeDream 2. Using David Scott's figures for the other three, here is the expanded table:

	Logistix	PD 2	PD 3	Schema
Load time	4s	10s	20s	70s
Save time	4s	5s	9s	10s
Recalc time	4s	2s	13s	90s
File size	130k	44k	44k	90k
Memory	c.700k	c.500k	800k	832k

Several interesting observations can be made about these figures. PipeDream 2 is twice as fast as PipeDream 3 at loading and saving and yet they are using the same code to perform these operations. The difference in speed is due to the overheads involved in PipeDream 3 being a desktop application. We believe Logistix is faster at loading but has a larger file size because it saves on disc a dump of its memory contents. It can save and load very quickly by using the equivalent of \*SAVE commands, but at the expensive of large indecipherable disc files. However, a more sophisticated approach has to be taken in the desktop world because memory management is far more complex. Both PipeDream and Schema have to process the data on saving and loading and both save ASCII files which can be processed readily by other applications.



The degradation in recalculation speed from PipeDream 2 to PipeDream 3 looks surprising. About half is due to running PipeDream 3 in the desktop environment. The other half is due to PipeDream 3's background recalculation which enables users to carry on using the computer whilst it is working away. PipeDream 3 is alone of the four in providing this facility.

PipeDream 3 has very sophisticated memory management and is able to give back to RISC-OS memory it no longer uses. Mostly this happens automatically but at any time can be forced by use of the "Tidy Up" command. In the example given above I find that Tidy Up reduces PipeDream 3's memory to only 736k.

Robert Macmillan, Colton Software. **A**

## Help!!!!

• **Archimedes artwork** – I want to start my own business using Impression/Poster to provide an artwork service for posters, leaflets etc. I am not getting into typesetting neither am I doing this just for pocket money. Any help / suggestions would be much appreciated, including likely prices charged for such work. B Edwards, 31 New Horse Road, Cheslyn Hay, Walsall, W Midlands WS6 7BH or phone 0922-418923 any time except 8 a.m. to 6 p.m. Tues to Sat.

• **Colour separations** – I have heard that there are colour separation programs to enable, for example, the Deskjet 500 to print a cyan, yellow, magenta and black version of a !Draw or sprite file, overprinting to get a whole coloured picture. Does anyone know of such an application? John Oversby, Middlesbrough.

• **Fortran friends wanted** – I am looking for fellow Fortran programmers with a view to swapping utilities, libraries and tips on using Fortran77 on the Archimedes. Contact KMC@UK.AC.RL.DE or snail mail @ K.M.Crennell, Greytops, The Lane, Chilton, Didcot, OX11 0SE.

• **High resolution greyscale monitors** – We have been trying (without a lot of success) to find a good greyscale monitor for use with the Archimedes – especially with DTP in mind. One reader is using a Viking II 20" in mode 23 on the A410 and is quite pleased but has anyone found anything else that works? If so, can you give us some details of price and supplier? Ed.

• **Star LC-200 colour printer** – I use a Star LC-200 with my A320-SCSI but very often when I print a page with !PrinterDM or !PrinterLC, I get a mysterious "A" on the right hand side of the

page. Can anybody help? A.M.Bårdholt, Storgt 89, N-3190 Horten, Norway.

## Help offered

• **Laser printing** – If you want Impression documents laser printing, Graham Whitehead will do it for a small fee. Contact him at 44 Elm Terrace, Westfield, Radstock, Bath BA3 3XS or phone him on 0761-431800 after 6 p.m. **A**

## Credit where it's due

• **Computer Concepts** – I had bought a copy of Impression Junior (1.05) and found a fault in the software where if I tried to get rid of a blank line in a frame on page 2, the program crashed *completely*! I wrote to CC and found that I was the only person to have written at the time about this. I was informed that the problem would be corrected in due course and an upgrade would be available at a cost of about £15.

In the latest issue of Archimedian a free upgrade to 1.11 was offered. I sent off my Junior disk and, by return of post, not only got a corrected version (1.12!) but also the latest versions of !PrinterDM (2.46) and !PrinterLJ and !SysMerge which is something I've only heard about until now! Many thanks CC! David Shepherdson

• **Datafile PD** – I have sent off for catalogues and demo disc from quite a few PD companies and have ordered software from some of them but certainly the fastest and cheapest I've found to date is The Datafile PD in Northern Ireland. All the discs have been sent by return of post and all are almost full with good PD software. Alan Hight **A**

## Competition Corner

### Colin Singleton

A packaging problem this month, loosely based on a real-life situation.

You and your Archimedes are in charge of the despatch department of a large company. Packages are coming to you along a conveyor belt. They range in weight (clearly marked on each) from 1 to 10,000, with an average of about 100. You have in front of you ten packing cases, each of which may contain packages to a maximum weight of 10,000.

As each package arrives, you must direct it into one of the ten cases before you even see the next package. It cannot then be moved. If there is no case with sufficient remaining capacity, you must despatch one case and then introduce a new empty one in its place.

The object of the competition is to write a program to make the necessary decisions with the aim of using the minimum number of packing cases for a sequence of 10,000 packages.

The sequence of weights is generated in Basic by  $X\% = \text{RND}(-\text{seed})$  followed by repeated calls to

```
DEFFNRND : X=RND(1) : X%=1+63  
*SQR(X/(1-X)):=X%.
```

This ensures (I hope) a realistic range with about 70% of the numbers less than the average, but a small number very much larger.

When you have developed your strategy, please send me your program, designed so that I can introduce my chosen seed, which will ensure that each entry is given the same sequence of 10,000 numbers. The program should count and display the number of cases used.

N.B. Although the function can generate numbers over 10,000 (about once in 20,000) the test sequence does not contain such a number.

Entries and comments please, either via Paul at NCS, or direct to me at 41 St Quentin Drive, Sheffield S17 4PN.

There are no winners to be announced this month. The May (Eulerian Square) and June (Queens) competitions are still open.

Puzzle addicts might also be interested in Public Key Cryptography, reviewed elsewhere in this issue (page 44). **A**

## Small Ads

- **A3000 1mb upgrade** (Morley expandable to 4mb) £50. Phone Fred Bambrough on 081-885-1034.
- **A3000** (no monitor) £300. Owner upgrading. Phone 0702-586536.
- **A310M RISC-OS**, PC emulator, 2 slot BP, 5¼" interface, ROM/RAM board with 170k RAM, joystick, software, Archive and Risc User. £650 the lot. Phone Bill on 0752-845214.
- **A410/1** - 4 M RAM, 20M drive, £950. Phone Glen on 0932-567614.
- **ABC Compiler** £45, GammaPlot £27.50, System Delta Plus £27.50, Twin £10, Voltmace joystick £12, Wordwise Plus (disc) £10, Digisim circuit simulator £12, Interdictor 2 £12. All as new. Phone 0782-771914 after 8 p.m. weekdays.
- **Archimedes 2nd floppy** with cables & 2 slot fascia £60, System Delta Plus 2 £30, InterWord disc £15, SpellMaster disc £25, PC emulator unused £50. Phone Howard Wilcox 0446-743770.
- **Archway 2** complete, unregistered £75. Would prefer to swap for PRM's. Bob Harding, 40 Bremhill, Calne, Wiltshire, SN11 9LD. Phone 0249-813209 evenings.
- **Beebug A4 Scavenger** scanner plus sheet-feeder for A300/400 £350 o.n.o. Phone Douglas on 0324-38816 after 6 p.m.
- **Chocks Away 2**, Interdictor 2, UIM, Wimp Game, Napoleonic Battle Simulator. £9 each or £40 for all five. Phone Chris on 0256-467574.
- **Computerware hard disk podule**. Atomwide 4-slot BP. Acorn 2nd floppy drive for A310.



Morley Teletext decoder + power supply. Offers to Chris Walker on 0953-604255.

• **!DeskAasm** – Desktop front end for Acorn Assembler. Send £5 to Darren Sillett, 43 Kingfisher Walk, Ash, Aldershot GU12 6RF.

• **MEG Nuffield Coordinated Science** – Admin software to produce all the necessary forms plus class lists for internal use – £10 from Paul Pibworth, 2 Pine Tree Drive, Hucclecote, Gloucester GL3 3AJ.

• **NEC P2200 printer** £140, Multipod digitiser sampler V2.20 £75, printer stand £15, floppy drive adaptor £20, FWPlus £25, ArcComm 1.48 £20, Enthar 7 £10. £275 the lot. Phone Chris on 0272-256196 day or 0271-850355 evenings.

• **Original software** – Hearsay £28, Knowledge Organiser £26, French Correspondence (unused) £12, Fads (unused) £15. Des Woon on 0255-882057.

• **Programmers!** – If you can program the Archimedes, we may be able to put some work your

way. Royalties or flat fee. Contact Brian Kerslake (Topologika) 0733-244682.

• **Qume Sprint Professional** daisywheel printer, spare daisywheels, sheet feeder, wide carriage. £120 o.n.o. Phone 0742-745209.

• **Technoscan II** handscanner £100. Phone Mark on 0384-455066 after 6 p.m.

**Charity Sales** – The following items are available for sale in aid of charity. PLEASE do not just send money – ring us on 0603-766592 to check if the items are still available. Thank you.

(If you have unwanted software or hardware for Archimedes computers, please send it in to the Archive office. If you have larger items where post would be expensive, just send us details of the item(s) and how the purchaser can get hold of them.)

Watford 5¼" disc interface (old type) £10, User Guides £1 + £3 postage, Genesis 1 £20, Herewith the Clues £10, Apocalypse £15, First Word Plus 2 £35, ArcWriter £3, PC Emulator 1.34 £35, Serial Interface/buffer for Epson FX80 £12. **A**

## 4Mb RAM for the A310. Now only £298.

Expands the A310 and A305 to 4Mb RAM.  
No soldering required.

Accepts larger OS ROMs if released.

Includes MEMC1a upgrade worth over £80.  
ARM3 compatible.

A no quibble money-back guarantee.

For only £298+VAT. (£350.15).

## A3000 memory

1Mb (i.e. 2Mb total)	£65
4Mb	£175
Bare board	£30

The 2Mb and 4Mb upgrades use only 8 RAM chips, and keep power consumption to a minimum. Prices include VAT.

## 400/1 memory

1Mb	£45
2Mb	£85
3Mb	£115

**Educational discount available.**

Further information and price list from;



**IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD. (0752) 847286**

# MiG29 Flight Simulator

## Ian O'Hara

MiG 29 is beautifully packaged. It comes on a bright red disc in a large box together with a manual and a glossy coffee table book on the aircraft. The latter is spoilt by having some quite nice photos split between two pages which ruins them. With all the flashy packaging, it is easy to see why the game cost £40.

The disc is unprotected and so the game can be copied onto your hard disc. It uses overlays, so if you have the memory, it is even better to copy it to ramdisc. Waiting for graphics and scenarios to load from floppy is tedious. Protection is provided by having to type in words from the manual in much the same way as for games such as Corruption and The Pawn.

Once the game is loaded you are presented with a view of Krasna Ploshad and the Kremlin being buzzed every few minutes. If they really flew that low over the square then poor old Lenin would have his bones shaken. Pressing <space> takes you through to the briefing room where you pick your scenario. There are six of these including a training area, buzzing a U.S. sub trapped in the ice, a night time session zapping terrorists and a full scale attack on a certain dictator not so far away from the Straits of Hormuz. All except the last one can be attempted at any time you like but, until you can fly the MiG properly, it's not a good idea to tangle with an opponent.

The graphics are very similar to Interdictor II though the colours are better and the animation smoother. The cockpit layout is different but it does not look much like that of the MiG. It is always a problem trying to fit all the dials, etc. in a real cockpit into the bottom half of a computer screen. If you were presented with all the dials it would make the game unplayable. All the instruments you need are there, such as altimeter and artificial horizon. There is also a very useful meter to tell you when your mouse is centred.

As armament, your plane carries a mixture of 23 mm cannon, unguided rockets, AA-8 and AS-7,

the number of the last two depending on the mission. If the threat comes from the air then more Aphids are carried.

Having picked a mission in the briefing room, you get a pretty picture to illustrate it. When you are bored with looking at this, you press <space>, don a g-suit and strap in. Start the engine, light the after-burner, release the wheel breaks and the plane accelerates down the runway. At around 3-400 km/hr back comes the stick and you are airborne. Then it's up with the landing gear and check the direction to the first way point. Gaining height, you reduce the throttle and turn towards the first target. Wings vertical, pull back the stick, you feel your g-suit inflating and you are into a 6-g turn. (As yet I haven't managed to go above 6-g.) Unloading g, you line up on the target, select your weapon and keep a sharp lookout. If you have a guided weapon selected, you can use the helmet mounted sight to locate the target. Spotting tanks, guns and planes from several thousand metres is not easy. At 200 metres per second you need good eyesight and fast reactions. Engage and destroy the target and home to the O Club for a bottle of ice cold Stolichnaya.

If you're unlucky and are hit by triple A, SAMs or a boggie then you can punch out. A simple key press and you lose a few cm in height as the ejection forces compress your spine. You can watch your aircraft fly away, bits falling off, as you slowly drift down and ponder on your first meal in the Baghdad or Peking Hilton.

No longer are you restricted to the cockpit. Press <V> and you can view the aircraft from outside. Press <M> when a guided weapon is in the air and you can see what it looks like to fly up the tail-pipe of a Shenyang F-7M. If you have ever wondered what it is like to ride a weapon as in Doctor Strangelove here is your chance. Be careful though. Make sure that your plane is safe. I have flown into the cumulo-granite clouds while riding a Kerry down to an oil rig. You can also watch yourself take off from the control tower or buzz a US sub from the sub. It all adds colour.



The one thing I really do like about the game is that you can fly about without being shot down in the first few minutes or having to achieve high scores to visit another scenario. I like flying round and exploring the world. In MiG 29, you can do this. You can also take an aggressive role and kill everything in sight. It is the best flight simulator I have yet seen on the Archimedes though I have not played Chocks Away.

There are one or two slight niggles. The packaging is very glossy. I am sure it displays well and adds to the price but it does nothing for the program. After going through title screens for the third time they get boring and after the tenth, positively annoying. After being shot down, all

you want to do is to get back in the hot seat again with the minimum of delay. However, the wait is not as bad as in some games. When looking out the cockpit it would be nice to be able to look up and down. With your wings vertical, you need to be able to look up to see where you are going. Left and right are useless in this situation.

My 'ideal' flight simulator has yet to be written. For example, it would be nice to get a skeleton into which one could drop different aircraft and scenarios. Until such a program comes along, I would recommend MiG 29 even with its high price – about £40 depending on the dealer you buy it from. (£38 through Archive.) **A**

## Multi-Media Column

### Ian Lynch News

Multi-media is continues to gain momentum, with Commodore launching CDTV, a system built around the Amiga and targeted on home users. Windows M will improve the capability of Windows 3 to run multi-media application on MS-DOS based systems and Apple have recently released System 7 which provides the Mac with some of the facilities we have been used to with RISC-OS for over two years.

Unfortunately, I have to write this column before the multi-media show in Olympia, but I know that Acorn have one or two exciting things to show. I will give a full report in next month's column.

### Avanti

One piece of software I saw recently on a visit to Fulbourn Road was Avanti, developed by Westland (of helicopter fame). They are using Avanti to author training materials for use by themselves and other industries. I must say that the demonstration was very impressive, as is the price – about £5,000 to non-education users and £1,000 to education. Before you all fall about laughing, Authorware which is possibly the biggest name in Mac and PC multi-media authoring is similarly priced.

### Cost-effective?

I talked to a company a few months ago and

watched Authorware being used on a Mac to generate applications for use in medical and scientific training. They told me that the software saved its purchase price on the first application since they previously wrote things in Pascal. Avanti, on first sight has a lot of features similar to Authorware and the demos were just as impressive. It isn't the sort of application most Archive readers would buy, but a question I am going to try and find the answer to, is whether or not it is better value than Genesis II. I suspect that anything that can be done in Avanti can be done in Genesis II, but the main criteria will be whether or not it is much easier to achieve with Avanti and whether applications run more speedily or take up less memory and disc space. With applications as complex as these, it will probably take some time to find out.

### Genesis II reference guide

I have now received a copy of the Genesis II script language guide. Personally, I have found it to be a model of clarity. If anyone wants to learn programming gently, a copy of Genesis II and this book will take some beating. Genesis scripts are very straight forward to understand and since a lot of the code is automatically generated, it is far easier to get satisfying results quickly than it is with Basic or C.

### Languages

One thing which is quite interesting about both Genesis II and Avanti is their relationship with Basic. Genesis II, and as far as I know Avanti, are both largely written in Basic. Whereas Genesis II generates its own script language, Avanti generates Basic V which can then be edited. C programmers, particularly those not familiar with Archimedes Basic will no doubt scoff, but it is a tribute to Basic V that such sophisticated applications are possible. Indeed, it is outcomes which matter not the process by which these are realised and I, and most other users, couldn't care less if the application is written in Chinese as long as it does the job it is intended to do.

### Correspondence

Letters have been somewhat thin on the ground recently, so come on, let's hear from you!

Michael Roscoe recently bought a copy of Genesis 1 second hand and although pleased with it he was surprised by its lack of capability when used as a conventional database. I think that it is fair to say that if you want a conventional database manager with standard report generation, fast indexed searches etc, then Genesis is not the right tool. !Squirrel, Flexifile or Junior Database are far more geared towards this type of work. Genesis is also quite capable as a simple type setter and you can do some reasonable DTP, but don't expect the sophistication and speed of Impression!

### Strengths

Genesis I is really best for making short presentations which involve graphics, sound, text and films linked in arbitrary ways (hence multi-media). It does have some pretty severe limitations, particularly on a 1Mb machine without a hard disc, since, as Michael points out, it is pretty memory hungry.

### Data galore

Genesis II gets round these problems to some extent by compressing all the files, but unfortunately the nature of the multi-media game is lots and lots of data. In fact, a "holy grail" of the multi-media industry is to achieve full screen motion video with at least TV quality. Imagine mode 15 screens, each of 160k being displayed 30 times a

second. That's 4.8 Mb per second – more if you want audio too. At this rate, a hard disc doesn't last long. Of course files can be compressed, but there are limits if quality is not to suffer and all the compression/decompression takes quite a bit out of the processor.

Genesis II is also a lot more flexible to use than Genesis I, because of the script language. It is quite feasible to write RISC-OS applications in Genesis II but, again, the price to pay for speed and ease of generation is usually relative slowness and a lot of code to achieve relatively little. Take for example Acorn's desktop calculator which is 8k of code. The calculator written in Genesis 2 as an example takes 17k of disc space, but over 300k of application space in RAM. Admittedly, the Genesis calculator is better presented than the Acorn one, but it does take over 15 seconds to load from the hard disc on my 540. Both calculators perform pretty well as quickly as each other.

I suspect that one of the reasons for the memory overhead is that the routines for playing films and sound samples will be loaded even though the calculator does not make use of them. In this case, a considerably more sophisticated application may not take up very much more memory so the relationship between memory overhead, speed of operation and application complexity is not a straight forward linear function.

### Horses for courses

The last paragraph should not put you off. What I am trying to illustrate is the fact that there is no such thing as a free lunch. You need to consider what tasks are most appropriately tackled using ARM code, Basic, C, Genesis etc and choose the appropriate tool. Further, as processing power increases and storage costs reduce, programs like Genesis II will be able to realistically tackle more complicated tasks.

It is very satisfying to generate professional looking applications and Genesis II brings this within the reach of ordinary mortals. It is increasingly the case that the really time-consuming part of generating applications is planning the layout and editing the graphics or producing animations. An eye for layout and presentational impact is



coming to be as important, if not more so, than technical expertise in coding.

### Finally...

Genesis II is definitely a useful tool for serious work of certain types but, for the hobbyist, it is also immense fun. I hope I have managed to convey some of the advantages and limitations for

those who have not yet had an opportunity to use the software themselves.

Hopefully, over the next few months, I will be able to make more comparisons between Genesis II, Avanti and Magpie. Some of this will depend on access to the latter two and the time it takes to explore them. **A**

## Hardware Column

### Brian Cowan

First I must apologise, particularly to my regular readers, for my absence for the last few issues. This time of year is pretty hectic for the universities, and together with other commitments I was unable to produce the column.

### Dongle dangers

My position on dongles is well known (as the politicians say!) – especially to readers of the Hardware Column. However, I have to be somewhat measured in any public criticism of commercial products. As it is, my postbag frequently contains letters from aggrieved vendors (not C.C. I hasten to add).

### Double dongles

I discovered some time ago that when my computer had both an Impression dongle and a WorraCad dongle connected, printing of First Word Plus files became garbled. I spoke to the people at Oak, whose reply was “impossible”. However they told me one potentially useful piece of information: the dongle must be attached close to the computer because of critical timing requirements. I ascertained by experiment that this was not actually as important as all that; the problem remained unresolved.

### New problems

My solution, albeit a tedious one, was to disconnect the dongles whenever they were not in use. However, the problem re-surfaced recently and I now think I have discovered what is going on. With just an Impression dongle attached to my Archimedes in my office at work, I found that First Word Plus documents were being printed with a random distribution of spurious characters. I gave that up as a bad job and converted entirely to Impression but my documents were being prin-

ted with a random background of fine dots – a sort of black snow. In desperation, I tried different printer drivers and I even telephoned the Archive Help Line! With a little detective work, all became clear.

### The solution

Clearly some of the data going to the printer was becoming corrupted. These were manifested as characters in First Word Plus and dots in Impression, because of the different printing methods. I thought that, perhaps, the printer had a malfunction or a connector was loose. On removing the dongle, the problem went away, eliminating the above possibilities but then I could not use Impression! It was time to sit down and think. (Others might have resorted to prayer!) Then it became clear. I was using quite a long printer cable; it was over two metres long. This could be the culprit, especially when combined with the additional attenuation of one or more dongles – and so it turned out to be. Using a shorter printer cable, all the problems disappeared.

### Conclusion

The conclusion, then, is simple. The use of dongles reduces the drive capability of the computer's printer port. It seems that you then *have* to have the printer placed adjacent to the computer for reliable operation.

### Portable Update

News of a possible Archimedes Portable has got some people rather excited. Latest rumours are that the Acorn portables will use an ARM3 processor. This raises the question of precisely who these machines will be aimed at. An ARM3 machine will not be cheap, so we must be talking about the business market rather than education. Where does UNIX fit into all this? Only time will

tell. With these new rumblings, I understand that Mike Harrison has put his A3000-based portable on "hold" until it becomes clear what the opposition are up to.

### ROM News

First some observations on the ROMs in the 540 machines. It seemed to me that some of the modules in the ROMs were different from the standard RISC-OS release. For a start, the 540 modules were smaller. However, when I used Basic, it claimed to be the old Basic V version 1.04. Also, a reader pointed out to me that in a 540, the Basic always seemed to be RmFaster'ed. The explanation for all this is that certain of the modules are compressed in the ROMs and expanded into RAM when the machine is booted up. With the extra code required for supporting the ARM3 cache and the new screen modes space was short in the 512K of ROM available.

That leads us nicely into the question of the new release of RISC-OS – all two megabytes worth. Here, I must emphasise that I have no concrete information; if I did have privileged information, I would be sworn to secrecy and breaking such a trust would have no benefit in the long run. I am speculating: connecting various rumours, putting two and two together and making twenty two! One pointer is the fact that the 540 machines have EPROMS; clearly Acorn do not regard it worthwhile to make new ROMs for the machines containing the old RISC-OS.

My suspicion is that the new RISC-OS will be released fairly soon, although I hear it is still rather bugged at present. However, I don't think it will be as earth-shattering, as was the original RISC-OS. The upgraded modules will have some improvements – for instance, disk operations will be multi-tasking. And a newer version of Basic V is likely, with a few minor improvements. The real question is what will be in all that extra space in the ROMs. A safe bet is that the ROMs will contain (updated) versions of Edit, Draw and Paint together with, possibly, a few fonts. It would then need some sort of ROM filing system and a ROM filer on the icon bar.

### ROM speedup

I don't think that the ROMs in the 540 can run fast enough for the old speedup trick to work. No one I know with a 540 has managed that. This is a pity, so I suppose we will have to wait for the real ROMs to appear rather than the present EP-ROMs.

I discovered, when examining the ever-expanding !Boot file on my 410 in my office, that I had disabled the ROM speedup even on that machine. Some programs were giving some trouble when running in fast mode and sometimes the screen would "disintegrate". I have since re-enabled the speedup, but the lesson is to beware and slow down if problems appear. So far, luckily, I have not lost any data.

### Printed Circuit Boards

Now for a real Hardware topic: the production of printed circuit boards. In the past, I have reviewed ARC-PCB from Silicon Vision. They have brought out a new version which I hope I might review in the future. For making relatively simple PCBs I have discovered that !Draw is quite adequate. Having produced the Draw file it can be plotted, on an HPGL plotter, using WorraPlot. Of course, using a plotter makes it difficult to fill areas for earth planes etc. But there is a solution...

### Laser printer

I am now the proud owner (well guardian really) of a Cannon LBP-4 laser printer driven by Computer Concepts' Laser Direct card. It is absolutely superb – but that is another story. I have discovered that it is possible to print out Draw file PCBs onto tracing film from the laser printer. The quality is superb and the line density is perfectly adequate for the UV process which we use. Of course, flood fills may be done trivially. This has really made life easy for us. For double sided boards, conventionally the tracks on either side are drawn in different colours. Using Draw Plus (Careware Disc 13) one can separate the two colours to produce the masters for each side.

### Schema Graphs

That brings me to an interesting hint on printing obstinate graphics files. Using Schema, it is



possible to produce nice-looking, although only rather primitive, graphs. These are generated in Draw format but when I tried to print them they hung the machine up. After much thinking, I came up with a solution: drop them into an Impression frame. The Impression document can then be printed out with ease. I don't know if any

other readers have had this problem with Schema graphs, but the solution works a treat.

If there are any readers using Schema for graphs then you will know that the macro language can be used to produce much better graphing facilities. Has anyone done anything along these lines? Perhaps we could do a Shareware disc of Schema macros. **A**

## VoiceBuilder

### Jeremy Mears

VoiceBuilder, which is not to be confused with Archimedes Voice Generator, is the second package from MJD Software for creating Archimedes voices. One drawback with the original AVG package was its complexity, and presumably in response to this criticism, MJD has released Voicebuilder, a much simpler, yet surprisingly versatile, package.

VoiceBuilder derives its name from the system it adopts for creating voices. Instead of drawing your own envelopes and waveforms as you would with SoundSynth, AVG and similar packages, with VoiceBuilder all that has been done for you, leaving a few vital 'blocks' which can be combined to produce a range of sounds.

Not being able to draw your own waveforms certainly limits the package's usefulness and there are no advanced features such as echo and transpose to be found on the more sophisticated packages. However, there are bound to be Archimedes users who have no need for this sophistication and would prefer the simpler, 'lego-like' method of VoiceBuilder.

There are three types of building-block; volume envelopes, waveforms and pitch envelopes, of which 16 are supplied of each. The volume envelope plays over the duration of the note, fading the volume in and out, the waveform affects the actual qualities of the sound (distinguishing a trumpet from a violin, for example, and the pitch envelope allows the pitch of the waveform to be scaled up and down while a note is playing. On top of the  $16^3$  (= 4096) permutations of block-built voices that can be created, there are also

options to further alter the volume and pitch envelopes through the parameters attack, repeat and release. Finally, there is the parameter, Pitch Span, which exaggerates or reduces the extent to which the pitch envelope affects the waveform, which is excellent for creating siren sounds.

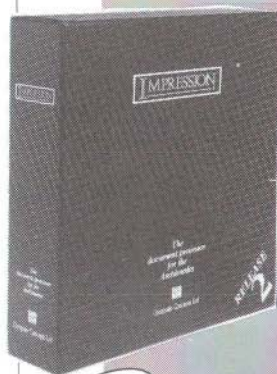
Once you are content with your combination of blocks and parameters, the waveform can be saved as a module or a VB/AVG specific file or played either by clicking on an icon in the top right of the window or via the Archimedes keyboard – offering limited musical possibilities. In fact, while writing this review I was running Voicebuilder in the background to interesting effect, as it responded to key-presses with notes of my last waveform!

The manual comes as a text file on the disc giving just the essentials for you to get started, and the application itself installs on the icon bar and takes only 200K of application memory. Therefore this package can easily be run alongside Maestro, for example, and waveforms may continuously be altered as the music is playing. Given the relative simplicity of the package, a text file manual is quite adequate and I was able to master the package in about twenty minutes.

For serious users wishing to edit samples and have precise control over the waveform, this package cannot be recommended. However, the low price of £19.95 + £1.50 UK postage, and the package's simplicity of use, makes it ideal for less experienced users who just want something to produce sound effects to use with Maestro and in their own programs. **A**



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# PipeLine

## Gerald Fitton

Firstly, some of the matters arising from your correspondence and then a tutorial showing how to calculate complex numbers in a PipeDream spreadsheet.

## Science attainment targets

Malcolm Cowell has brought out version 1.2 of this PipeDream application. The version I have is a demonstration version which allows the setting up of an extendable database for recording and reporting pupil performance against the Science National Curriculum Attainment Targets. Entries can be made up against each pupil in a tutor group for each of seventeen Attainment Targets for all ten levels and the various statements within levels. I can send you a copy of this demonstration version; the full version is obtainable from Malcolm for about £3.00. (Write to him c/o Abacus Training.)

## Dedicated time calculator

Bob Ames has written to me to let me know that there is a dedicated portable Time Calculator available that he strongly recommends to anyone needing to add up (or do other arithmetic calculations) where the values are measured in Hr Min Sec format (rather than decimals of an hour or minute). Please write to him at Ayton House, Ramsey Heights, Huntingdon, Cambs, PE17 1RJ for more details.

## !Help bold expressions

Stephen Gaynor would like to know the best way of using printer highlight codes to highlight expression slots. Perhaps the simplest example is to try to change into bold the slot that contains the sum of a column of figures. Stephen has a method which, he says, works rather inelegantly. In the past I've tried and failed. My method is even less elegant. What I have had to do is to use Snapshot to turn the numbers into text and then embolden the sum as text. Stephen uses two separate highlight codes, both of which are not turned off at the end of the slot. The first code turns on bold and the second turns it off. If the first code (the turn on code) is placed in a slot just before the sum

then its effect continues through the slot containing the sum. The second code is placed in a slot just after the slot containing the sum. Has anyone a better method?

## Public transport calculations

Peter Stoner is a Senior Public Transport Assistant based in Carlisle. He uses PipeDream as a tool to help him with many aspects of bus route planning. His disc contains over 200 kbytes and, amongst other interesting files, there is an 11 kbyte macro which will reverse a list of places. Such a list forms part of a timetable for travelling in one direction. Reverse the list before time-tabling in the other direction. I can see a use for a time difference calculator which, having written out one set of times, calculates a similar set of times backwards as a starting point for the reverse route. If you would like a copy of Peter's disc or have anything you would like to contribute to his use of PipeDream this way then send it to me and I will pass it on to him.

## File conversions

If you have files that you want converting, out them on a disc and send them to me in the first instance and I will pass them on, probably to Ian Williamson who has volunteered to coordinate this area of interest. In the more specialised field of Masterfile to PipeDream conversion, Betty Mines has written a BASIC program that has been most useful to her and might be to you. David Holden has sent me an Interword to PipeDream converter which he describes as being a temporary measure until he produces a new all formats converter.

## PipeLine in Berlin

Reinhard G Giesder, Krefelderstr 20, W-1000 Berlin 21 asks if there are any PipeLine readers in Berlin (or Germany) – if you do then he would like you to write to him.

## Spark

Let me try to clear up some confusion I might have caused. Spark is a program which compresses and decompresses files. The compressed program, application, document, etc, is not corrupted



in any way but is coded so that the information within it takes up less bytes. File compression has the advantage that more files (or files which are more than 800 kbytes long such as huge sprites from an A4 scanner) can be squashed onto an 800 kbyte floppy disc. If data is communicated electronically then it is usually quicker to transfer a compressed file than the original.

If you have a file which has been compressed using Spark then you need to expand it back to its original size before trying to use it. David Pilling, who wrote Spark, has made a PD version of Spark, called Sparkplug which just contains the expander routines. This is freely available but he (rightly in my view) charges for the purchase of Spark. Because SparkPlug has been made freely available, Spark has become the standard compression format for Archimedes files.

Norwich Computer Services is a typical user of file compression. NCS has a copy of the Spark compressor which they use to compress files on many of the discs they sell. On each of the discs of compressed files they include a copy of the PD program needed to expand the compressed files – Sparkplug.

On this month's Archive disc you will find a compressed version of Daniel Dorling's bibliography. It is in the directory called DataBase. Because of its size it has been impossible to include this large PipeDream application in its uncompressed form. People vary in their reaction to finding compressed files on discs they have bought. Some feel they have got more bytes for their money, some don't like the extra 'hassle' of unpacking the files. As an experiment on the July 1991 PipeLine disc I am going to use Spark to compress some of the largest files. A copy of SparkPlug will be included on the disc. None of the ReadMe files will be compressed.

Please write to me and let me know if this use of compression is acceptable to you and, more generally, how you feel about compressing PipeDream applications. I have other large databases to which similar considerations apply.

### Editing macros

In Pipedream @ is a rather special character. If you need what is called a 'literal' @ (i.e. a real

live printed @) then you must press <@> twice. If you don't do this, the single @ will tell PipeDream that what follows is not to be printed literally (i.e. as you see it) but must be interpreted as a PipeDream command. A typical example is the inclusion of a graphic by using a command such as @G:MyGraphic,50@. This command will include the graphic file MyGraphic at 50% of full scale. More common is a key definition which includes a sequence which starts with "@ and ends with @".

The two lines below form part of my 'key' macro (which is automatically loaded when PipeDream starts up). My default printer font is Trinity and so I have arranged that pressing the three keys <Ctrl-Shift-F1> simultaneously invokes the insert font command. By the way, the sequence \FQ|m in the second line ensures that a blank default document is not called up as PipeDream is installed.

```
\Cdf|i "Ctrl-Shift F1" |i
"@F:Homerton.Bold@" |m
\FQ|m
```

If you create a macro which includes some command such as the font "@<command>" above, then, when you load it into PipeDream, you will not see the command unless you place the cursor in the line containing the command. For example, you must place the cursor in the line containing "@F:Homerton.Bold@" to see it. Most of you get this far and understand what is going on. Now here's the tricky bit. If you save the macro as it now appears, the command bracketed by the @ signs, and the @ signs themselves, disappear! The result is that the macro doesn't work any more. If you reload it to find out why, you will see the lines below. The first of these lines does not change when you put the cursor in that line because the @ signs have gone!

```
\Cdf|i "Ctrl-Shift F1" |i "" |m
\FQ|m
```

If you get to this point where the @ signs are gone, you have to start again. However, let's go back to the earlier macro with the @<command>@ present but only visible when the cursor is in that first line. What you have to do is <ctrl-

BSE>, (Block SEarch and replace) to substitute @@ for @ wherever it appears. Do this before you save the macro and it will still work after saving. What happens is that the double @@ is replaced by a single @ during the saving process; you start the save with two @ and you finish the save with one @.

If you are totally confused by this (I hope not), I suggest that you will have to revert to using Acorn's !Edit to edit macros rather than PipeDream since @ signs in Edit are always treated literally.

### Complex numbers

Complex numbers are part of most GCE A level maths courses as well as being obligatory for BTEC engineering and many other courses. The paragraphs below might prove of particular interest to those of you teaching complex numbers and who need to generate interesting and instructive numerical examples. If you are an educationalist, you will be interested to know that I have found that getting students to use actual numbers gives them a much better 'feel' for what is going on than when they manipulate algebraic formulae. 'Hands on' learning is particularly effective for the practical engineer, the teaching (or are they called learning?) objectives are grasped much more quickly. I have received comments such as "I've never understood complex numbers before" from mature engineers (with a decade of field work behind them) after only a couple of hours of entering actual numbers into a spreadsheet such as an extended version of the spreadsheet Complex01 described below.

First an introduction to complex numbers for those of you unfamiliar with them.

I have yet to find a hand calculator which will let me find the square root of  $-4$  or the logarithm of  $-1$  even though, in the domain of complex numbers, both of these exist. Perhaps the most famous complex number is the square root of  $-1$ .  $\text{Sqr}(-1)$  is represented in two ways. Mathematicians use the symbol  $i$  and engineers use  $j$  (because they use  $i$  for electric current) for the positive square root of  $-1$ . The other square root of  $-1$  is  $-i$ . I prefer to say that  $i * i = -1$  rather than talk about  $i$  being the square root of  $-1$ .

Complex numbers can be considered to have two parts, a Real part and an Imaginary part. These may be visualised as the  $x$  and  $y$  coordinates of a point on a two dimensional sheet of graph paper. A complex number such as  $(3 + 4i)$  is said to have a Real ( $x$ ) part of 3 and an Imaginary ( $y$ ) part of 4 and may be plotted as  $x$  and  $y$  coordinates on the so called Argand Diagram (named after its inventor).

After addition and subtraction, perhaps the simplest thing that can be done with a complex number is multiplication. For example, the square of  $(3 + 4i)$  is  $(3 + 4i)(3 + 4i)$  which becomes  $9 + 24i + 16i^2$ . Now, remember that  $i^2$  is really  $-1$  and you get  $9 + 24i - 16$  as the answer. This can be simplified to  $-7 + 24i$ , a Real part of  $-7$  and an Imaginary part of  $+24$ . I think that a better way of looking at complex numbers is as pairs of Real numbers for which the symbol  $i$  is used as a separator and, for which,  $i * i = -1$ .

As an example this month I shall show you how to raise a complex number to any power, even a complex power (later, try to find  $e^{-i\pi}$  - it evaluates to  $-1$ ). The spreadsheet application I have called Complex01 has, as input, two complex numbers called  $z$  and  $w$  and I find  $z^w$ . The file Complex01 is on the Archive monthly disc. Figure 1, shown below, is a screenshot showing the sheet Complex01 being used with  $z = i$  and  $w = 2$  to find  $i^2 = -1$ . The intermediate steps are to find the logarithm of  $z$ , multiply the logarithm by  $w$  and then use the exponential function to find the inverse logarithm. For those of you more familiar with Real numbers, try out the formulae given in

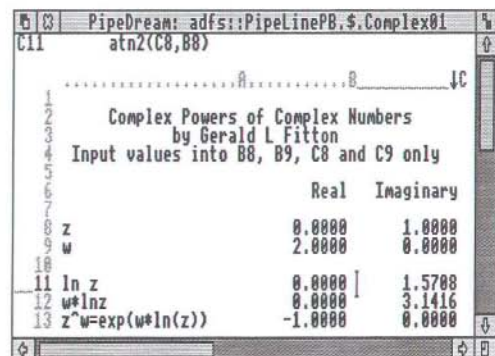


Figure 1



text form in cell A13 of Figure 1,  $z^w = e^{(w \ln(z))}$ , on your calculator (using a positive Real for  $z$  and a Real for  $w$ ) and convince yourself that it works. Multiplication (as we have seen) can be used on complex numbers; the two other very basic functions are exponentiation (exp) and its inverse, the logarithmic function (ln – not log). The formulae for evaluating these functions as functions of complex numbers are in the cells of the sheet.

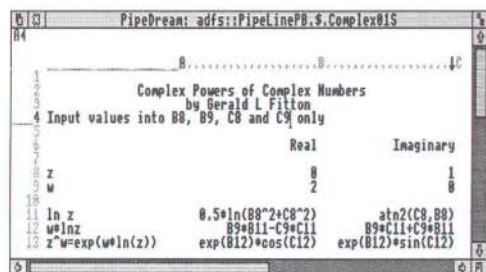


Figure 2

All these 'clever' formulae (e.g. for ln and exp) are in the cell block B11C13. They appear as text in Figure 2. If you want to follow through this tutorial then either type them in as expressions or load the file Complex01 from the Archive monthly disc.

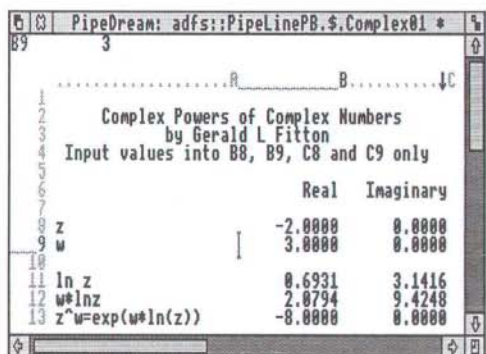


Figure 3

When you have Complex01 spreadsheet, you can show that Real powers of negative Real numbers work out correctly. Figure 3 is a snapshot of the spreadsheet correctly evaluating  $(-2)^3 = -8$ . The intermediate results show that  $\ln(z)$  has an Imaginary part which, to 4 decimal places, is 3.1416.

Do you recognise this number? Try using the spreadsheet to prove that  $\ln(-1) = i\pi$  by entering  $-1$  into B8 (the Real part of  $z$ ).

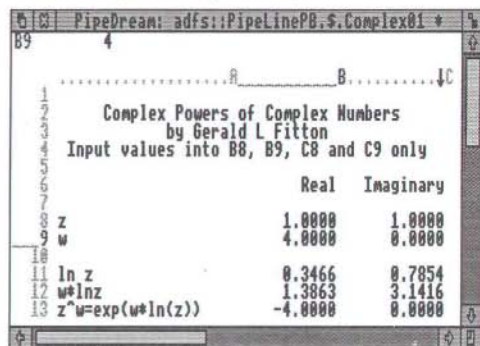


Figure 4

Figure 4 is a shot that shows that  $(1+i)^4 = -4$ . You can work this out by using the usual algebraic multiplication formulae (or the binomial expansion) and replacing  $i^2$  with  $-1$  whenever it occurs.

Division of complex numbers is executed by multiplying by a reciprocal. Division (or finding reciprocals) is a common GCE A level problem which is solved numerically by using the value  $w = -1$ . Put  $w = 0.5$  to find the principal square root; the second root is a bit harder to find but it can be deduced from the principal root.

If you have an interest in complex numbers then please write and let me know what sort of numerical examples you would like to see in spreadsheet format and I'll see what I can do for you. On the July 1991 PipeLine disc I have included more common functions of complex variables such as the trigonometrical and hyperbolic functions (and their inverses) so that you can use them, get numerical results (only the principal values) and see how the functions are implemented. I have found that electrical engineers particularly get highly addicted to this spreadsheet and find it a most worthwhile learning experience.

I would like to hear from anyone who has done (or wants to do) a complex numerical integration application (e.g. to find values of the Gamma function).

### PipeDream V 3.14

It looks to me as if Version 3.14 of PipeDream is fairly 'stable'. My information from Colton Software is that there is no further upgrade planned at present. So, if you haven't yet upgraded from an earlier version then you might as well do it now rather than wait for the next upgrade. For those of you with a current subscription to PipeLine I have an official upgrade kit from Colton Software; if you send me your master disc together with a label and a stamp I will get an upgrade back to you by return post. For those of you who are not PipeLine subscribers, you can get an upgrade in the same way from Colton Software direct but it may not be by return of post.

### In conclusion

Once or twice a month, I get letters which have been forwarded to me from Norwich Computer Services. I have no connection with NCS other than writing this monthly column. Letters should be addressed to me at the Abacus Training address given on the inside rear cover of Archive. Incidentally, I have no connection with Colton Software either. Apart from the help which Colton Software give me with your problems, we operate completely independently of each other. My 'day job' is as a Lecturer at Swindon College of F.E. where I teach mainly Maths and Stats (and their applications). To me, at college, the comp-

uter is a tool (which I employ considerably as a student centred teaching resource) rather than an end in itself. We have nothing as powerful as an Archimedes there – the standard is the 286 PC.

I created Abacus Training about ten years ago as a way of keeping my personal accounts separate from anything I might earn 'on the side' as a private tutor. A year ago, when I started selling the quarterly PipeLine discs, it seemed to me that using Abacus Training for this would keep the accounts of PipeLine together so that I could keep track of the loss (or profit) I was making. We are not a corporate body and our turnover is not sufficient to push us over the VAT threshold.

I am pleased with the way that PipeLine has developed a sort of User Group 'feel'. I do enjoy reading your letters and trying out the programs and applications which you send in. I get a kick out of being able to share the knowledge I have gleaned from you (and my own efforts) about PipeDream and the Archimedes or when I can help someone overcome what to them is an insuperable problem. I suspect this secret thrill rather than the money is why Paul set up Norwich Computer Services in the first place. Like Paul, I don't always succeed, but when I do help somebody it feels good. I'm sure it is that which motivates me more than anything else so please keep your letters and discs coming in. **A**

## Archive Mugs for Sale!

Now that we have got the Archive mugs back from the manufacturers, I can report that they really are rather attractive. If you imagine the top couple of inches of the front cover (but without the date, issue number and price!) in blue and black on a white mug, you will get the picture of what the new Archive mugs look like.

I was hoping that someone would write in saying how nice they were so I could give an unsolicited testimonial but no such luck. All I can do is offer a money-back guarantee if you are not absolutely satisfied.

**£3 each (+ £1 p&p) or four for £10 (+ £2 p&p)**

(We normally quote prices inclusive of p&p but in this case it is such a large proportion of the cost, I think it's better to see it separately.)

Why not pop into the Archive office and pick up some mugs? – It saves you the postage!



# RISC-OS Spreadsheet – !Calc

## Edward Naish

After my wife bought her Archimedes and I had learned to use it, I set about collecting a suite of basic utility programs – wordprocessor, spreadsheet, accounts, database etc. RISC-OS was hot off the press then and there was not a lot of choice especially in terms of proper multi tasking applications. I noticed in the Help! section of Archive 3.2 p27 a reference to “!Calc, a spreadsheet for the Archimedes”. I sent off for more details and ended up buying it.

!Calc is a fairly simple and easily understood multi tasking spreadsheet. It installs itself on the icon bar in the usual way and selecting it brings up two movable windows: the sheet itself and the command window which takes all the input. Clicking on the sheet moves the cursor around the 56 columns and 100 rows as you want. Clicking <menu> pops up a conventional list. The menu's first label, 'options' allows altering cursor movement, justification of text, filing and column order. The next three labels refer to the palette. You can alter background colour, text colour and cursor colour using any of fifteen different colours. These choices can be saved. The original sheet was a very colourful arrangement of a royal blue background with white text and a red cursor. I have always found light text on a dark background to be rather tiring, so a little experimenting soon showed me how to change the 'upset' file in the application so that the colours matched with 'Edit'. This I find to be much more restful.

'Print' is done using its own built in printer driver, although the use of the RISC-OS drivers are promised in future. 'Export' allows the export of a complete or partial sheet as an 'Edit' file. (This enables you to use the RISC-OS printer drivers if you wish). 'Save' is a conventional operation, both on complete and partial sheets. Clicking <menu> on the command window produces a screen full of Help in case you have forgotten what command you want next.

!Calc makes use of the </> symbol to enter commands, hence </.> with a number in the range 0-

7 gives the number of decimal places in the current column. </W> sets the column width in the same way. Use <\\> if the command is to be global. Relative and absolute replication is supported. Column order can be rearranged as you develop a sheet but row order is fixed. Setting the justification as you want makes it possible to change a cell width so you may use the top row or the first column for long labels or titles.

The command window has an input slot where all the typing is done. Underneath is a red box which gives the co-ordinates of the current cursor position and next to it another slot where the content of the current cell is displayed. Pressing <Insert> will copy the content slot to the input slot for editing. The content slot shows the current cell formula, if there is one, rather than the current value displayed on the sheet. Double clicking on a cell loads its co-ordinates into the input slot. Double clicking <Adjust> on a cell wipes it clean. At the bottom of the window is a 'calculate' button and a note of the amount of memory left. <Escape> will toggle the command window on and off so as to give an uninterrupted view of the sheet when required. It also moves the input focus from sheet to command window and vice versa as required. This allows use of the cursor keys to move the sheet cursor and also to edit the input slot as required. If the input focus is on the sheet and you wish to enter characters into the input slot, there is no need to alter the focus, typing the first character does this automatically.

The first eight function keys are used, some of them being duplicates of menu items.

The manual is a very high quality 15 page spiral bound A4 laser printed document. As a registered user your name and address is printed on the first page.

The main weakness of !Calc at the moment is the small number of functions provided (seven at the moment) but three more are promised soon. Upgrades come frequently, two in the last twelve months. (V2.18 now). What I value most about it, apart from ease of use, is that if you have a

problem, or a suggestion for a new feature or improvement, a letter to the author produces an explanation, or the upgrade suggested, in a very short time. I find it very enjoyable to be directly involved in the development of a program in this manner. Surely this is only one step removed from bespoke software. I find it rather puzzling that the previously quoted reference to !Calc in

Archive is the only mention that I have seen of it anywhere. This is really hiding your lantern under a bushel. How many more programs are there out there that I want and don't know about?

!Calc is written by Colin Turnbull and is available from him at 13, Woodhall Terrace, Juniper Green, Edinburgh, EH14 5BR, price £20. **A**

## Concept Designer

### Diane Hobson

I presume that anyone interested in this review will already know what a concept keyboard is but in case you don't, I will give a brief explanation.

A concept keyboard can be attached to your computer, usually via a user port (on the Acorn I/O expansion card) or less commonly via the Serial Port. It is made up of 128 touch sensitive squares, or cells, and can be used as an alternative input to the normal keyboard. Each cell, or a group of cells, can be set up to enter, for example, text into a word processor or to move the cursor or pointer around the screen.

Its main use is in schools for children whose written vocabulary can be greatly enhanced enabling them to write words they may otherwise not use for fear of spelling errors and for the physically handicapped who may not be able to use an ordinary keyboard.

### The review

When I offered to review Concept Designer (from Longman Logotron price £24 + VAT) all I expected was a concept keyboard design program and the utility to use it with RISC-OS applications. However, the disc contains much more than that!

As well as the expected programs namely !CKDriver and !CKDesign there are two further utilities, !TouchData (similar to Touch Explorer Plus on the BBC) and !SoftTouch, a concept keyboard Emulator enabling you to test or even use overlays without a concept keyboard attached!

The disc also included a ReadMe file which contained details of an important feature added since the documentation had been printed; several example overlays and the relevant sprite files for

these; six Drawfiles to aid overlay design; some highly technical text files for the use of developers of concept keyboard aware programs.

The versions under review are: !CKDriver v.1.50, !CKDesign v.1.51, !TouchData v.1.50, !SoftTouch v.1.50

All the applications appear fully RISC-OS compliant. The disc is not copy protected and installs easily on to a hard disc. (Thankfully, you do not need the "Key Disc" as with Longmans other programs, which I find the most irritating type of protection.) !CKDriver can be distributed freely for educational use provided no charge is made. The other programs may not.

### The manual

The manual is an A4 booklet which is well written and easy to follow. There is a contents page which is almost as comprehensive as an index but there is no separate index. Also included are copies of the example overlays, although I feel these would have been better supplied as separate sheets because you either have to photocopy them or cut them out to use them on the concept keyboard.

Be sure to read any ReadMe files on your disc as there may be an addition to the manual, as there was with my version.

### !CKDriver

When this is installed, any overlay files can be loaded by double-clicking or dragging to the !CKDriver icon (on the left hand side of the icon bar). Alternatively just double click on the overlay file and !CKDriver will load automatically (provided it has been seen). The amount of memory used is only 32k, so you should have enough memory available even on a 1M machine. You



cannot quit the driver to reclaim the memory and carry on as if it were loaded.

The concept keyboard can then be used with any multitasking RISC-OS program. It does not work at the command line or with a non-multitasking program. This is a shame – but then all programs should be multi-tasking – although it would be useful to be able to use it with the command line or in BASIC.

If you wish to change overlays, just drag the new one to the icon bar or double click on it. This will then be the current overlay. Clicking the <menu> button over !CKDriver produces eight options:

*Info* – tells you the version you are using.

*Overlay* – tells you the current overlay name.

*On/Off* – allows you to switch concept keyboard input on/off. (This does not switch off the power to the concept keyboard, just the ability to use it). The menu option will be ticked if on.

*Keyboard* – to select the type of concept keyboard you are using i.e. Parallel, Serial, Concept PC(!) or Alternative. (Alternative is used for special situations e.g. !SoftTouch although this will set “Alternative” automatically).

*Delays* – to select the timing of keypresses and repeats etc.

*Emulation* – Keyboard or Mouse (or both).

*Save Settings* – Once you have set the other options, you can save your setting so that they will be correct next time you load !CKDriver.

*Quit* – Remove !CKDriver.

## !CKDesign

This application only uses 64k of memory.

Making the overlays for use with !CKDriver is fairly simple. Just double click on !CKDesign and it will load onto the icon bar (on the right hand side). When you click on this icon, two windows will open. One is a grid representing the cells on the concept keyboard and the other shows the strings or commands that you are using. This will of course be empty at present.

It is easier if you decide on and enter the data before choosing the layout of the overlay on the grid, but it can be done after if you wish.

## Entering the strings

The data strings can be entered in two ways.

1) Click <menu> over either window and move the pointer across on the option Enter. You are given a dialogue box into which you can enter your text string or command, press <return> and the string will then be shown in the data window and will be automatically numbered as they are entered. However, if you have lots of separate strings to enter, this method can be rather tedious, so it would be better to choose the second method.

2) The second method involves using a text editor (e.g. !Edit) or a word processor. The text file icon (type &FFF only) is just dragged to one of the !CKDesign windows. When preparing the text file, pressing <return> twice between strings means !CKDesign will treat them separately and give them separate numbers.

Strings can be plain text or include the special top bit characters or can be \*commands or represent a special key such as <return> or <delete>. These are entered by the key name surrounded by square brackets i.e. [RETURN] or [DELETE]. Some of the more common ones are already programmed into the function keys when !CKDesign is loaded and these can be altered in the !Run file if you wish.

Do not make the mistake I did and enter [SPACE] as a special key. It can only be entered by just pressing the space bar although it does look like a blank numbered entry. You can of course enter spaces at the end of your text strings, rather than nominate its own cell(s), but I always feel its better for children to enter the spaces themselves.

If you need to edit or delete any of your data, this can be done by clicking <adjust> over the item to be edited. This then activates the edit and delete options on the menu.

\*Commands can be entered in a string so you can even load an application from the concept keyboard. You could even set up an overlay to automatically load the word processor you wish to use it with.

You can assign areas to represent mouse or cursor movements or mouse clicks. The commands for

these are given in the manual and example overlays are included. This together with some \*commands to load programs all on one overlay could enable a disabled person to use their computer unaided.

You can allocate more than 128 cells if you wish by using the Shift option on the menu. If you choose to do this, each cell in the window will be divided in half, the top half representing the shifted key.

Also, you can have several layers of overlays. You assign an area on each of the layers that when pressed will take you to the required layer. The instructions on how to use and design these are well documented.

Once you have completed your overlay you can save it by using the menu option Save, into which you can enter the path or simply drag the icon to the directory viewer. The overlays are given their own filetype (C84) and icon and can be renamed after saving without this being affected.

Unfortunately, and I feel this is the only criticism I have for this package, you cannot automatically print out your overlay. This is a great shame because, after spending time designing it, you should not then have to spend much more time in creating a draw file to get a printout. Some draw files are included to help with this, but they are not very satisfactory as the grids go over the paper limits and this should not be necessary. For now, I think I will stick to entering the data by hand on a blank photocopy. No blanks are provided incidentally.

### Editing

If you wish to edit a previously saved overlay this is done by just dragging the file to the !CKDesign icon on the icon bar. The windows will open and can be edited using the same features as you did when designing. Only one overlay can be loaded at a time so you cannot transfer data between overlays. If you have an unsaved overlay loaded you will be warned before it is replaced.

### !SoftTouch

This provides emulation of the concept keyboard and uses only 32k of memory. You do not even have to have a concept keyboard attached! It

loads to the icon bar and when you click on its icon a window opens showing a grid representing the concept keyboard cells. The "cells" can then be clicked on with the mouse pointer to produce the input that the real concept keyboard would if you pressed the same cell.

When an overlay is loaded into !CKDriver and !SoftTouch is loaded, it will automatically take over from the real concept keyboard. You can change this by selecting parallel again in the !CK-Driver menu. Even when an overlay is loaded, the !SoftTouch grid will be blank, although a sprite can be loaded onto it to represent the input. An example of this is included.

The grid can be shown in different colours and four different sizes. These can be chosen from the menu. If you prefer not to use the mouse, the grid cell number can be entered instead (from the menu option Key). Shift Lock can also be chosen from the menu if your overlay requires.

!SoftTouch is a good idea and very useful for testing out overlays. However I do wish the cell representation was shown automatically as designing a sprite overlay takes (me anyway) much longer to make than the overlay file.

### !TouchData

This application is similar to Touch Explorer Plus on the BBC and uses just 32k of memory. Any overlay files can be used and when the cell is touched, a window opens displaying the contents.

A picture overlay can be used (an example is provided) and when a part of the picture is touched the corresponding text displayed on screen or a text overlay used and !TouchData could display the picture. An example is provided where several layers are used and one shows a picture of a musical instrument and another gives full information about it.

The menu gives you six options relating to the display. You can change the size, font, where the window appears on screen, foreground and background colours.

The design of your overlays really depends on the extent of your imagination. A section in the manual "Advanced Overlay Design" deals with many ideas. I know that on the BBC Touch Explorer



Plus, files have been designed for many topics and used as software teaching aids in their own right. This utility should enable the same to happen for the Archimedes.

Whether !TouchData is as comprehensive as Touch Explorer Plus, I am unable to say as I am not familiar with Touch Explorer Plus, but I know you can print out the overlay!

### Conclusion

This package is extremely good value. It contains all the applications someone with a concept keyboard could want and, because of !SoftTouch, even someone who has not! All the programs are easy to use.

The main omission I feel is not being able to print out the finished overlay automatically. If this facility could be added it would be a great bonus.

The overlays I had been using previously, provided by the very few programs that could be used with a concept keyboard (mainly !Stylus), are not compatible with this package and the !CKDesign overlays are not compatible with !Stylus (in fact when I tried to use one it crashed the machine). So you will have to re-design any overlays you may have been using before. However, I feel this is worth it for the greater compatibility this package offers.

All in all I can recommend Concept Designer. **A**

## LOGO and Algebra

### Alan Angus

The language Logo is widely used in school mathematics and, almost always, it is used for geometrical work using turtle graphics. This is good in itself but turtle graphics represents only a tiny part of the potential of Logo.

I am interested in using computers to explore elementary algebra, and list processing languages such as LISP, Logo and EdScheme are well suited to this. Over the last year I have been teaching myself Logo programming using Brian Harvey's excellent three volume work, Computer Science Logo Style published by the MIT Press. Anyone seriously interested in programming with Logo and similar languages should get hold of this.

Using routines taken from Harvey I have developed some simple workspaces (listed at the end of the article). The one I am going to discuss here is about number sequences. The variables "S1 and "S2 contain lists of numbers and when the routine SEQ is initiated, the user is presented with a display like this;

(\* is the multiplication sign)

You can have a two more attempts if you get the formula wrong the first time.

2 3 4 5 6 7 8 9 10 11

In this case, the formula is obviously N+1. When the formula is typed in, the routine SEQ\_SUB tests it by forming a sequence of numbers called INSEQ by mapping the formula FORM over the integers 1 to 10 stored in variable I. If the sequence is correct then FORMTEST outputs "GOOD", otherwise it returns "BAD". The output of FORMTEST is used by SEQ to control what happens next, e.g. moving on to the next number sequence or giving the user another go at the present sequence.

All the clever work is done by the routines MAP, STUFF etc. that are taken from Harvey volume 1. Get hold of a copy and look this up, then try experimenting for yourself with the real power of Logo.

The routines are in the workspace SEQ and once this is loaded, you start up by typing SEQ :S1 to use the first list of number sequences, or SEQ :S2 for the other list.

I originally implemented SEQ in APL, and this was quite easy as the mapping of functions over

Try to write a formula for the sequence in terms of N, where N is the integer giving the position of the number in the sequence.

An example of a formula is  
2 \* N \* N + 3

lists of numbers is built in to that language. However, when I demonstrated the program to other maths teachers, they were not too keen on using it because of APL's "non standard" rules of precedence. For example, with  $2*N+1$ , the addition would be done first because of APL's "right to left" rule. In Logo, the precedence order used is the same as that normally taught in the mathematics classroom.

If your use of Logo has been limited to simple turtle graphics, you should get hold of a good book and learn a little bit about list processing. It can be hard going at first, especially if you are unfamiliar with recursion, but before long you

will find yourself toying with ideas that are far from BASIC.

Fairly recently, the EdScheme version of Scheme has become available to Archimedes users. I have started to experiment with this and, in many ways, it is superior to Logo, having many powerful functions built in to the language and a much better way of grouping together subroutines and controlling local variables. If you don't have Logo already, this new language is probably a better buy and it certainly is if you are a student aiming at studying computer science at a reasonably high level.

---

```

TO MAP :TEMPLATE :INPUTS
IF WORD? :INPUTS [OP MAP.WORD :TEMPLATE :INPUTS]
OP MAP.LIST :TEMPLATE :INPUTS
END

TO STUFF :THING :TEMPLATE
; from Harvey vol.1 Using N instead of ? in templates
IF EMPTY? :TEMPLATE [OP []]
IF EQUAL? FIRST :TEMPLATE "N [OP FPUT :THING STUFF :THING BF :TEMPLATE]
IF WORD? FIRST :TEMPLATE [OP FPUT FIRST :TEMPLATE STUFF :THING BF :TEMPLATE]
OP FPUT (STUFF :THING FIRST :TEMPLATE) (STUFF :THING BF :TEMPLATE)
END

TO FORMTEST :TS
IF EQUAL? :TS (FIRST :SEQUENCES) [OP "GOOD] [OP "BAD]
END

TO SEQ_SUB
PR [The sequence is]
PR FIRST :SEQUENCES
PR []
MAKE "FORM RL
MAKE "INSEQ MAP :FORM :I
PR :INSEQ
PR []
IF EQUAL? (FORMTEST :INSEQ) "GOOD [PR [Good]]
END

TO SEQ :SEQUENCES
; some sequences stored in "S1, "S2
IF EMPTY? :SEQUENCES [(PR "Finished) STOP]
PR [] PR []
PR [Try to write a formula for the sequence in terms of N,]
PR [where N is the integer giving the position of the number]
PR [in the sequence.]

```



```

PR [An example of a formula is 2 * N * N + 3]
PR [( * is the multiplication sign)]
PR [You can have a two more attempts if you get the formula]
PR [wrong the first time.]
PR [] PR []
SEQ_SUB
IF EQUAL? (FORMTEST :INSEQ) "BAD [PR [Have another go] SEQ_SUB]
IF EQUAL? (FORMTEST :INSEQ) "BAD [PR [Last chance!] SEQ_SUB]
IF EQUAL? (FORMTEST :INSEQ) "BAD [PR [That one was too hard for you,
                                note it down and think about it]]
SEQ BF :SEQUENCES
END

TO MAP.WORD :TEMPLATE :INPUTS
IF EMPTY? :INPUTS [OP "]
OP WORD (RUN STUFF QUOTED FIRST :INPUTS :TEMPLATE) (MAP.WORD :TEMPLATE
  BF :INPUTS)
END

TO MAP.LIST :TEMPLATE :INPUTS
IF EMPTY? :INPUTS [OP []]
OP FPUT (RUN STUFF QUOTED FIRST :INPUTS :TEMPLATE) (MAP.LIST :TEMPLATE
  BF :INPUTS)
END

TO QUOTED :THING
IF LIST? :THING [OP :THING]
OP WORD "" :THING
END

MAKE "S2 [[0 2 4 6 8 10 12 14 16 18] [1 4 9 16 25 36 49 64 81 100]
  [-1 1 3 5 7 9 11 13 15 17]]
MAKE "I [1 2 3 4 5 6 7 8 9 10]
MAKE "S1 [[1 2 3 4 5 6 7 8 9 10] [2 3 4 5 6 7 8 9 10 11]
  [2 4 6 8 10 12 14 16 18 20] [-4 -3 -2 -1 0 1 2 3 4 5]]
MAKE "FORM [N - 4] A

```

## Matters Arising

• **Acorn SCSI podule problems** – One reader (well, it was Ian Lynch, actually) who uses a removable drive on an A540 reckoned we had overstated the complaints about the Syquest (MR45's) drives "not working with the new Acorn SCSI cards as used on A540's". They do work most of the time. It's just that if you are copying lots of files it hangs up, sometimes, in the middle of the copying procedure. Acorn are still working on a solution to the problem. In the meantime, a reader has written a patch which he is selling for £20

which solves the problems but it comes as a machine code routine with (surprise, surprise) no source code and a strict prohibition against trying to disassemble the code. This is available through N.C.S. for £23.50 inc VAT.

If you have problems on an Acorn SCSI card with not being able to get the cartridge out of a removable drive, try using a \*RMREINIT SCSIFS.

• **Hard Drive problems** – Following on from Tord Eriksson's "Silent Computing" article last month, Oak Computers say that you must NOT fit

a thermostatic switch on the fan and you most certainly WILL invalidate your warranty (*as Ed suggested!*) if you do so. They are not just being awkward, there is a logical reason. Let me explain. Obviously, if a drive gets up to 70°C or more then it is quite likely to cause damage but that is not the main problem. The *real* danger is that if the fan is not used, the drive may heat up too *quickly*. Apparently, it's the rate of rise of

temperature that is critical because it causes differential expansion and this can cause a head crash. So please do not start disconnecting your fans – silence is golden, maybe, but in this case it could also be very expensive. This was also discovered, the hard way, by another Archive reader so it's not just suppliers being over-sensitive. His drive was U/S as a result, so you have been warned. **A**

## Public Key Cryptography

### Colin Singleton

Sometime in the late seventies I was intrigued by an article in, I think, *Scientific American*, describing a new 'unbreakable code'. We have all seen 'secret codes' for sending messages, most of which can be cracked very quickly with ingenuity and intelligent guesswork. This one was different. It could not be cracked, they said. Furthermore, it did not rely on secret methods or parameters agreed in advance, which could be intercepted by enemy intelligence. The method, and the parameters necessary to encode a message (or *encrypt* it, in the preferred jargon) can be public knowledge! Indeed they must be, for the system to work.

The method was discovered in 1977 by Rivest, Shamir and Adleman and is known by the letters RSA. At that time the technique was regarded by most as little more than an interesting novelty, since you would have needed a computer the size of a removal van to carry out the necessary encryption and decryption! Now, however, it is well within the scope of Archimedes.

Enter George Foot and Roger Sewell. In January this year, they published a magazine called *The Public Key*, reviewed in Archive 4.5 by Brian Cowan. Issue N° 2 of this occasional series is now available, as reported in Archive last month. For those who already have N° 1, the new issue costs £1.50 (EC £2.50, Rest of the World £3.50). For newcomers, both issues plus the software on disc are available for £5.00 (EC £6, Rest £7). These charges are to cover costs (which they do not quite do) – this is not a commercial venture. Please send cheques to George at 'Waterfall', Uvedale Road, Oxted, Surrey RH8 0EW.

What fascinated me originally was the mathematical simplicity of the technique. Each person wishing to use the facility must calculate for himself three parameters, which I will call  $M$  (modulus),  $E$  (encryption key) and  $D$  (decryption key). If the text of the message (or part of it) is represented numerically as  $T$ , then the corresponding cryptic text,  $C$ , is calculated, using the published  $M$  and  $E$  parameters for the intended recipient, by

$$C = T^E \text{ MOD } (M)$$

The recipient derives the original text by

$$T = C^D \text{ MOD } (M)$$

Of course, the values  $M$ ,  $E$  and  $D$  must satisfy a certain mathematical relationship for this to work. This is not secret, and is explained, briefly, in *The Public Key* N° 1. I hope Roger will explain in a future issue the technique by which suitable trios of values are obtained. For the moment, suffice to say that the software will generate suitable numbers for you.

The parameters  $M$  and  $E$  for each person are published (in the magazine, and on the disc) so that anyone can encrypt a message to send to anyone on the list. Each person must keep his decryption key secret, since only with this can a message encrypted using his  $M$  and  $E$  be decrypted.

The beauty of the system is that although each person's  $M$  and  $E$  parameters are published, and  $D$  is linked to them mathematically, it is not possible (or rather not *practical*) to calculate  $D$  from  $M$  and  $E$ . This works because  $M$  is the product of two large prime numbers, each typically around  $10^{77}$ . Finding the prime factors, given only the product, is fiendishly difficult. The



Public Key (N° 2) reports the latest estimate that a network of 2,000 processors, specially designed for this purpose, and costing \$50,000 each, could crack one key per year (between them, not each)! I have used the software to send and receive messages and, to my delight, it worked first time! That in spite of the fact that I decided to be clever and use the 'digital signature' feature. This double-encryption technique relies on the fact that the keys *E* and *D* are interchangeable. Used correctly, the process enables the recipient of a message to be absolutely certain that the sender of a message is indeed who he claims to be. Signature authentication is of vital importance in the prevention of fraud in private and business transactions alike.

How does the program find a guaranteed prime number of the order of  $10^{77}$ ? There is a tantalising insight into this in The Public Key N° 2. I have analysed the technique from the program coding, and found it most interesting. This aspect will, I have no doubt, be covered in a later issue.

Software to provide these facilities needs to process rather large numbers (up to  $10^{154}$ ). So, as an added bonus, the program contains a comprehensive multi-length arithmetic package. The

functions available are explained in detail in The Public Key N° 2, in the form of commands which can be used in 'calculator' mode. The coding requirements to use them in other programs, however, are not given. This is the carrot to entice us to order issue N° 3. I have already done so.

Issue N° 2 also contains an interesting article on the time taken for encryption related to the size of the data blocks, which in turn relates to the degree of security. I got a little bogged down with the  $O()$  function, though I suppose I must have 'done' it at school at some time. My interpretation of it as *proportional to* earned a rebuke from Roger Sewell, but for most of us this conveys the right general concept.

What The Public Key needs is support, principally in the form of comment and discussion on the techniques and scope of Public Key Cryptography. Even if you foresee no need for the ultimate data security offered by this encryption technique, perhaps you would be interested in its capabilities. Also, even though the calculations appear so simple, the study of the mathematical background is fascinating.

Send your cheque off to George right away! **A**

## Prism versus Other Art Packages

### Victor Russell

*(We have had criticisms that some of our reviews have been too superficial but we have to balance that against the need to make best use of the number of pages available. This is a rather longer review than usual but I thought I would publish it as it is and see what people thought.)*

I am sure that we all agree that programs for our favourite micro should be properly RISC-OS, the action taking place in resizable windows – no nasty Mac/Windows menus across the top, etc, etc. Fair enough, but what about *art* programs? Should they be a special case, officially exempt so to speak, from standard RISC-OS menu requirements? The point is that, whereas with a WP program you only occasionally have to access menus to change styles, with painting programs

you do it all the time, especially when choosing colour. So one can reasonably argue that full-blooded RISC-OS is unreasonable.

Here is a thought as an alternative to sheep-counting some sleepless night: if you were designing a painting program, how would you organise the various menus? I have been looking at four programs with a view to buying for my school and it is interesting to see how each goes about its basic design. Only Revelation works in RISC-OS windows: the other three take over the entire screen. They install on the icon bar and can be exited temporarily to allow work with other programs. You press <menu> to get menus as expected and, when drawing, no menus are on screen. With Atelier, you just move off to remove current menu, with Artisan2 you move off and start to draw, with Prism it depends on the type of menu.

**Atelier** works in mode 15 (256 colours). When you have a menu (in words) you press <select> to choose or to move up and down the menu tree. If you press <menu> again when you are on one of these menus you get the colour choice box so that it is never more than two mouse presses away. Sub-options (flags) are clicked off and on from the colour or certain other boxes. Confusingly, the same flag can have different effects with different tools: this is one of Atelier's weak features, at any rate for beginners.

**Artisan2** is a 16-colour (mode 12) program. (I meant to get Pro-Artisan but ordered the wrong Artisan by mistake, and have been too lazy to get the right one yet.) It is entirely icon driven, in what one might call the classic way. There is a master menu and just one level below that which makes moving around easier than with Atelier. The colour box icon is on every sub-menu, so again it is easily accessible. Sub-options, if they exist, are obtained by pressing <adjust> rather than <select> on the appropriate icon. This makes the program very easy to use but it is fair to remark that although it is a capable program, it is less powerful than Atelier.

**Revelation** is quite different. For a start, it works in any screen mode and in one of two ways, RISC-OS or "Special". The latter is a sort of super-RISC-OS in that you can persuade most menus to stay on screen by tearing them off the master menu. This includes the colour box. If you are happy working with a less than screen size drawing window then life is very easy, but these menu windows are a bit of a nuisance if you are working on the whole screen. When you choose a particular tool, its sub-options drop down. This is probably a good idea, although it can be irritating if you are used to a program like Atelier in which a particular painting style can be applied with any tool.

### Prism

What about Prism, the subject of this review? Like Atelier, it only works in a full mode 15 screen. When you press <menu> (or first click on the icon-bar icon), you get a standard mouse pointer and an elegantly mounted menu at the top, with nine choices in writing, namely Prefs, Brush,

Drawing, Options, Screen, Prism, Lines, Curves and Desk. As you slide along the menu, sub-menus drop down and if you slide down the sub-menus, those with a further sub-menu, shown by an arrow, open up. (Is the author a Mac fan? You can even set a Pref to make it yet more Mac-ish.) You click on your chosen one, and all menus disappear (or a fancy editing box appears). To make a further choice, you have to press <menu> again to call up the menu, slide across and down and choose again. This can all be an infuriating process!

The colour choice box is accessed from one of the sub-menus: it has no special status. It can also be called up by pressing F1. F-keys with Shift, Ctrl, Alt or on their own mostly have actions mapped onto them. So has the Print key (but it is not for printing!). This makes for a much too complicated key strip. If I do buy this program for general school use, I shall certainly not issue key-strips, but merely explain the functions of <F1> and <Print>. There is no on-screen help, no change of pointer, no status display of any kind. (Atelier and Artisan have help windows, and Revelation at least shows current colour, tool and sub-option(s).) You can call one up, but not all that easily, and anyway it is far too complicated, showing the condition of irrelevant flags and dormant options as well as current ones.

It is a notable feature of Prism that it never attempts to anticipate your next action. Say that you are drawing in a red using circular pencil and go into the brush menu and select a particular brush (sprite). When you start drawing again you are still drawing red circles: you have to actually choose to *use* the brush. Or suppose you want to restrict drawing to a window within the screen and you find the Window sub-menu and choose Define. That is easy enough – you just click on one corner and widen out the window rectangle as you would expect. One more click and all visual reference to a window has gone. Alas, drawing occurs anywhere on screen – it appears that your attempt at defining a window has been unsuccessful. What you should have done was to go back into the Window menu and choose Turn On. There is still no visual difference but now attempts to draw do only occur within the window.



When you have grown used to it, you realise that this is not a bad idea: you always know where you are. In contrast, Atelier at times attempts to anticipate your thoughts: for instance, if you set the style of the fancy Range Fill that you want, it automatically selects Range Fill as your next action, which is probably but not necessarily what you want to do.

Options for any particular kind of action are for it alone, as in Artisan and Revelation, a better scheme than Atelier's.

## Documentation

The manual is OK, with the expected tutorial and reference section, but it is printed rather poorly. You do get an audio tape for training beginners, and even a video – which I have not seen – if you buy a site licence. If you were feeling unkind you might say that more on-screen help would be better! The tape would probably be quite helpful for a complete beginner: I found it boring, but I think that was my fault.

## Colours

All art programs have specialities unless they are free. Revelation's is its sophisticated colour processing of images and Atelier's its ability to wrap images round 'bottles' and other 3-D surfaces. (I do not myself particularly like either of these, the former because I have not found it all that useful, the latter because like a few other of the program's features it is so painfully slow.) Prism's best claim to fame is probably its selection of colours.

When you first call up Choose Paint, a sub-menu of Drawing, you get 512 (no, I have not worked out why!) solid colours in one rectangle, current colour in another quite large window, and nine choices – Colour, Dither, Artist, Shades, Pattern, Cycles, Tinter, Brush and CLS, plus an arrow that allows the menu to be flipped to bottom or back to the top of the screen, to allow colours under it to be sampled. <Select> produces the colour-choice window for each of the eight 'colours', <adjust> an edit mode.

When you are in choice mode, as you roam around the colours, you see the colour under the pointer displayed in the large window at the side of the colours rectangle. You just press <select>

on the colour you want. As you continue to move, the colour in this window continues to change, but when you move onto the menu surround it solidifies to your chosen colour. You pick a colour off the screen in the same way. This is an excellent feature, for you can see for certain what the colour is, even if it is just a thin line or part of a dither. (To pick a colour off screen in Revelation you have to select and use a special tool, in Atelier an F-key, but only when no menu is on view: both of these methods are rather fiddly.) This does take a little while to get used to: at first I tended to choose a colour from the menu, go down off the menu and try to draw: nothing happened, for in fact I was just re-selecting a colour off the screen, black in this case! When you have chosen your colour you have to press <menu> to get rid of the colour menu before you do anything else.

Dither gives you a choice of 512 dithers (two colours in a chequerboard pattern) and Shades likewise, but with Shades, each solid colour is dithered with 16 shades of grey. Cycles gives you a choice of 64 cycles, usually of one colour dithered with grey shades. This is for use with sprays etc, not range fills which use their own cycles. Artist is an interesting idea: you build up a selection of 512 colours, chosen in various ways, that particularly suit the current picture. You might build up a selection of flesh tones for instance. Patterns presents you with 32 patterns, 16 of them begging to be edited. Tinter presents the 256 colours (not 512 this time!) and, when used, it just deposits the colour on half of the screen pixels (always the same half of course).

Pressing <adjust> on any of the first seven choices (not Tinter or Brush) produces a different, editing menu. The Dither and Shade editors are great fun! You roam around a vast chequerboard of dithered colours and press <select> on your chosen rectangle of 512. Your selection is referenced by co-ordinates so that you can choose the same ones some other day if you want. (You can use dithers in the other programs of course, but you have to make them up yourself as patterns or sprites: this is not nearly so good as Prism's ready-made method.) The Colour edit menu

allows changing of any one or more colours on screen for any other set and is very easy to operate. The Cycles editor is also easy to use: you can choose any one colour and have it automatically dithered with grey shades or you can manually build up a cycle from any of the other menus. The Artist editor allows you to build up a set of colours in various ways.

### Editing patterns

The Pattern editor is a joy to use – Prism at its stylish best. It takes up about three-quarters of the screen area, symmetrically placed, and divided into five windows with six action buttons in writing. The separate windows are all framed in Prism's typical soft rounded style (buff at centre, shading to black at the edge giving a raised effect). The top window shows all 32 patterns, each two 'units' wide, where a unit is 16 pixels by 16. The bottom window shows the colours (512 again!) and the last three are across the middle. The left one shows a large tessellation of the current pattern, the right hand one shows the current colour and the middle one is the editing window, 16 by 16 small outlined squares. You can choose a colour from this window with <adjust> as well as from the main colour rectangle. The six action buttons are Flipx, Flipy, Mirror, Repeat, Wipe and Grab.

Mirror mirrors the top left quarter both ways to create a doubly symmetrical pattern and Repeat translates the top left into the other three quarters. Grab shows the current screen with a fair-sized window on top-left or bottom-left – move around the screen, with the area under the cursor showing under the window, and press <select> when you have something you like. Some quite young children happened to be in one day when I was using this editor and loved it! They found it exciting that they could create patterns so easily, see them proper size as they were created, and then just press <menu> to get back to the usual colour menu, and finally CLS to clear whole screen to their pattern. One press of <adjust> and they were back in the editor ready to create more patterns. You can create patterns in the other programs that I have been looking at but they are not nearly as pleasant to use or as efficient.

### Drawing

Having chosen a colour – which remember can be any one of a pattern, a dither, a solid colour etc – we want to use it. Main menu offers three choices that lead to painting tools, Drawing, Lines and Curves. Lines and Curves are easy to use; your chosen one is a Shape. They can be Single (straight) Line, Rubber (straight) lines, Square, Rectangle, Parallelogram, Polygon (which offers a further choice between Circular, Elliptical and Define), Single Curve, Rubber Curve, Circle, Ellipse, Arc, Sector and Segment.

Pressing <select> on Shape Details produces one of Prism's fancy editing windows, with four buttons and a window with a dot in it. Pressing the first button toggles between Line and Fill, the second between Move and Fix. If you choose Fix then one point of the shape is fixed: you can draw concentric circles etc. The other two buttons are for enlarging or decreasing the dot in the window: it becomes a larger or smaller circle which sets the size of the outline of the shape if it is Line rather than Fill. None of the other programs offers this shape drawing with lines of variable thickness. Shape Repeat allows drawing with the last shape you selected, which can be a very useful feature at times. It applies even if the last shape you drew was a line segment (and even if you drew with shapes some time ago: there is always a current shape defined, even if it is dormant).

The remaining options are fairly obvious. Rubber Curve draws '3-point curves': click on two end points and then pull out the line anywhere between them to create a curve. Absence of curve drawing like this is a notable omission from Revelation and Artisan2. Atelier does have this feature but with one small but irritating difference from Prism – when you have drawn your curve segment the cursor is left free, whereas the second end point of the curve becomes the first of a new curve in Prism, i.e. you can draw a continuous twisting line fairly accurately.

The Drawing menus are more complicated: on offer are Choose paint, Paint fill, Range fill, Pencil, Spray brush, and Pixel editing. Pixel editing does what it says, rather stylishly (for brush or screen). (Atelier's is similar, but shows less of the



screen at once and lacks Prism's Undo and Fill. Revelation has no pixel editing per se: instead, you can just have another view in a different RISC-OS window, at a different magnification. This sounds better, for you can use all tools in either window but pixel editors are nice to use, with scrolling automatic in the second window: it is a nuisance in Revelation that you often have to scroll manually to make the windows match.) Pencil and Spray brush have similar sub-choices.

Spray brush offers Points, Squares, Circles, Shape, Brush, Mask, Spray size and Point size. Point size alters the size of Circles and Squares – nice that you can spray more than just dots. Spray size alters the size of the circular outline. The rest are the things you actually spray. Mask is the solid shape of the outline of the current brush (i.e. excluding any bits you have masked out). They all work in the current colour except Brush. When you spray with a Brush, you actually spray complete brushes, an eccentric idea. If, on the other hand, current colour happens to be Brush and you spray say circles, you will just spray part of the brush onto the screen. Sorry if this confuses you! Logically, you should be able to spray or use pencil with Mask using Brush as colour, but it's one of several bugs that this will not work: colour reverts to last chosen solid colour.

Range fills are to my mind an important feature of computer art packages, and both Atelier and Prism offer a vast array of them. Prism has fills at an angle and rather finer control over the amount of dithering between colours but it lacks one of Atelier's excellent features, Radial fills. (Artisan2 calls these 'circle fills'.) Both have rather weird editing boxes, Prism's being marginally worse. One button cycles through Line Graded, User Graded, Auto Graded and Auto Shaped: I here-with bet my life savings that you cannot work out in advance what these all mean! Revelation has no range fills of any kind, a serious omission.

### Brushes

Prism calls sprites 'brushes', à la !Paint. (Atelier calls them sprites, and Revelation calls them motifs, which have a dual existence as patterns.) Brush is one of the main menu options, with sub-menu Select (choose between different brushes in memory, each shown full size as you cycle

through them), Pick up (obvious), Transparency, Drawing, Rotate, Brush, Mask, EffectsX, EffectsY. Transparency is handled very well: you just click on the colours you want to mask out and click on Create. You can even Invert, masking out the colours that you have not clicked on. Also, you can undo masked-out colours. This is one of Prism's best features. It is much less easy in Atelier, and you cannot do it in Revelation. Drawing allows choice between Single and Multiple. Using Multiple, the brush (or its transformation) is drawn continuously to screen when you press <select>. Atelier calls this Sprite Blit, but fast drawing only occurs with the basic sprite: rotations in particular are painfully slow and none of the Atelier transformations can be repeated. Revelation's can, but there are no really fancy ones, just rotations and enlargements and combinations thereof.

The rest of the options are to do with selection of a transformation (distortion) of the brush. (Mask uses current colour within the brush outline, suitably transformed.) Brush and Mask allow various rectangular enlargements. The Effects are very striking. You can choose from Shear, C bend, S bend1, S bend2 and Distort. The S bends are particularly unusual: you bend the rectangular brush outline into an S bend. Then you can draw as many of these as you want, as with all the transformations – and these are drawn really fast. It makes a sprite look as if it is drawn on a scroll. Distort (not mentioned in the manual) squashes the brush into any enclosed space (called Copy Fill in Atelier, not available in Revelation). Sadly, the transparency mask is not respected in Distort, nor in Rotations, and neither is it anywhere within the program when Brush is used as the current colour.

### Other main menu items

Prefs allows mostly rather frivolous changes: you can choose how menus open for instance!

The Options allow Co-ordinates to be displayed (like Atelier, but without the help), Mouse lock, Grid lock, Clock (a periodic alarm to remind you to save), Window (to restrict drawing to a window), Colour Logic (EOR etc), and Undo action. To undo in Revelation you have to call up and select from a menu, which is a nuisance, and it

does not always seem to work. In Atelier you press an F-key: this restores the screen to just after the last menu was called up (i.e. a menu press fixes the screen.) For my money, Prism and Artisan2 have the best method: you just press <adjust> to undo the last action: this is the sole function of that mouse button within the main drawing screen, and it works with all operations. Prism also allows you to change from the default Single undo to Multiple: now <adjust> returns you to the screen that was last Fixed, which is done from the next main menu option or by pressing Print. (Why Print I wonder?).

Screen offers Fix screen, various Area transformations (a subset of the Brush ones) and Colour Cycle. The latter is the most mysterious of Prism's functions. Its sub-menu offers various ways of doing this colour change. The manual says that it changes each colour of the colour cycle to the one above but why you should want to do that I cannot think. Anyway, what it does is amazing, if not very useful. Try it if you have a chance to use Prism at an exhibition. You can create rather unsettling pictures, or transform existing ones, very quickly. They tend to look rather like organic Mandelbrot sets, or perhaps dissected Martians.

Prism offers Colour fixing, Sketch pad, Text, Magic colour, Page details, Free memory, Prism status, Prism credits. Page details allow you to extend the screen a bit, but I found this difficult to use. Free memory restores this memory (for sprite storage). Sketch pad is a good idea gone wrong: if you have no brushes stored, you can flip to a secondary drawing area. But since it cannot co-exist with brushes and you cannot save or use any of it, it is a pointless facility. Now if you could design a brush on it . . . Revelation has a 'colour palette' for creating motifs, one of its best features.

Colour fixing allows one or more colours to be fixed on screen so that you cannot draw over them. You can Invert so that only those colours *can* be drawn on.

I was disappointed by Text: it uses a resident bit-mapped font, in just a few selectable sizes. There is a very good editor (you can even have outlined text), but who wants to mess around with a font editor these days? To change fonts, you have to exit to the desktop and load in a new one: there

are a dozen not very exciting ones supplied. Contrast Atelier: it accepts any outline font available and allows you to widen out a rectangle for your text to fit into. Artisan2 also uses bit-mapped fonts. Revelation uses outline fonts but size has to be set by altering point size in the font dialogue box: this is fine in WP or DTP programs, less appropriate than Atelier's method for a freehand art package.

Magic colour *is* special. When anything is drawn using Brush or Pattern as colour, or if a region is to be Range filled, it is first filled in the 'magic colour'. The algorithm scans the screen and uses all area(s) of magic colour to fill in. Nothing exceptional about that you say? Here is the fancy part: you can draw one or more shapes in the magic colour, draw another in a plain colour and Range fill or Distort a Brush into it: the fill is spread across the disconnected regions! Just think: you can scan in a photograph (or digitise) yourself, pull this into Prism as a brush and then spread your image round several circles (or rectangles or triangles or sectors or ...). Artisan2 allows this distorting into disconnected shapes as well, although it can be difficult to get accurate fitting because of the way it works.

Desk is the final main menu option: as expected you exit to the desktop and, if you subsequently return, you find everything exactly as you left it (as with Atelier).

### Bugs!

The program crashes fatally if you create disjoint regions using the magic colour and then try to fill on the magic colour. There are several other non-fatal bugs associated with magic colour and there is the disappointing fact, already noted, that sprite transparencies do not work in all circumstances. In Atelier, pressing <escape> aborts partly completed operations (very desirable since some of them take an age to complete). In Prism, <escape> takes effect only when the current operation is complete and then always restores to plain line drawing.

### Input/Output

This is all done from the desktop. Screens and sprites can be saved in ordinary 'system' form or compressed. This is very efficient – I have tried a number of screens and they all saved in com-



pressed format very much faster than in Atelier, and used less memory. Typically, a screen saved as 40 or 50K for a quite complex screen in two or three seconds, against Atelier's 50 or 60K and thirty seconds plus. Patterns, colour sets, preferences and fonts can also be saved. You can print full size or enlarged by factors 2, 4 or 8, with cut marks printed, using your own screen dump printer driver. Prism co-exists happily with any other installed programs and you can change mode at any time but must manually change to mode 15 before actually using the program. Atelier selects mode 15 itself and on exit returns you to the previous mode, a friendlier scheme, but it does one very, very naughty thing: it unplugs a relocatable (International keyboard), and fails to RmReinit it – very puzzling for beginners who try subsequently to use <Alt> to get top-bit-set characters in a WP package. Revelation works in any screen mode, a very strong recommendation, but you cannot change mode once it is installed on the icon bar: no doubt there is a technical reason for this but it can be very irritating.

### Best buy?

Artisan2 is protected by using a colour chart whereas Revelation requires the insertion of the key disc every time it is loaded. (This key-disc protection does not apply, however, when a school buys a site licence.) Revelation is nice in that it is RISC-OS compliant and it can make sense of sprites created in one mode but loaded into another. However, it also has some notable weaknesses: you cannot Range fill, nor mask out parts of a sprite, nor use many geometrical shapes. The first two of these are key parts of modern computer art packages. I personally do not like the program, which may well be my fault. I think that it is because it deliberately departs from the conventions that have grown up around computer art programs and almost hides some of its features in an effort to create an air of simplicity.

As between Atelier and Prism and Pro-Artisan which I have yet to use seriously I am still not sure. All three use unprotected discs which is a good start. What Prism does well, it does very well. It is often very stylish, and using the soft rounded menus is pleasant, as working in good conditions is pleasant. However, it is also irritatingly self-indulgent at times. As to the actual

features of the packages, Atelier certainly wins. It lacks the dither colour selections of Prism, some of its shape drawing features, its fancy ready-made sprite transformations and its colour-changing but there are far more facilities of Atelier that Prism lacks – radial fills, text any size, the wrap-round-3D-image transformations and a whole range of useful ways of interacting with the screen. There is 'intensity paint' (reading intensity from the screen and re-doing in the correct shade of the current colour), 'mixing paint' (a feature of Revelation's as well), 'washing' (more sensibly called 'blurring' in Revelation, a sort of anti-aliasing of boundaries), pixellation (lowering resolution – an interesting computer effect when applied to areas of a finished picture), to name but a few. So is Atelier the best? I suppose it is really but the fact is that I prefer to use Prism where possible. Its menus and editing boxes are very pleasant and, above all, it is really easy to choose colours. It is probably true to say that Prism is better at creating pictures, Atelier (or Revelation) at editing them. It is also true that none of these programs is perfect: none gives even the vaguest help with perspective for instance.

### Other opinions

Let us hear what some other people think – shortened and paraphrased:–

*Art teacher unused to computers of any kind:* I prefer Paint! Actually I do like what I have seen of Prism, but for pupils it is too complicated. Revelation is too ugly: let's go for Atelier – I like its Help box.

*Able pupil who is an Archimedes lover:* Revelation! – it's the only one that's RISC-OS.

*Artistic computer-literate pupil, unused to Archimedes:* Prism is hard to get used to, but I do like its menus and some of its functions. Its wide choice of colours gives it the edge over Atelier even though it lacks some features.

*Younger pupils:* Artisan is easiest. We like Prism's pattern editor, but the whole program is too difficult. Atelier is difficult too, but at least you get some help. Revelation doesn't seem to do enough.

So, you pays your money...! (£61.20 +VAT from XOB or £200 for a site licence, to be exact.) **A**

# Developing a RISC-OS Utility – Part 2

## Darren Sillett

The aim of this article is to provide a collection of routines for manipulating RISC-OS menus. The program code presented with this article together with that from Part 1 (Archive 4.8, May 1991) will produce a working application. This utility enables the user to change the settings of some of the system variables by means of a simple menu structure.

### Menus

The RISC-OS menuing system provides a multi-level menu structure. This means that any menu item can itself have its own menu. To accomplish this in your own programs, you need to set up a fairly complex data structure to pass to the window manager. I have tried to simplify this by providing two routines to create the menu.

The first routine (FNcreate\_menu) creates a single level menu by parsing a string which describes the desired menu. The string takes the form:

"Title,First option,Second Option,Last Option"

This creates a single level menu with three options.

Each option can be followed by a special character to achieve effects such as ticks and dotted lines.

These characters are:

# – menu item is ticked,

\$ – menu item is followed by a dotted line,

% – menu item is shaded,

^ – menu item is writeable.

Lines 235 – 255 illustrate this routine.

The second routine (PROCmenu\_attach) attaches two menus together to form a multi-level menu. The first parameter is the parent menu, the second is the menu item number that the child menu is to be attached to, and the third parameter is the child menu. See lines 260 – 275 of !RunImage for an example of this.

### Other routines

There are several other routines provided in the

extended Wimplib which are used to query and manipulate the menu structure.

The most important ones are PROCshow\_menu and PROCdecode\_menu which enable the application to display the menu and work out what has been chosen once the menu is displayed. PROCreshow\_menu is used whenever <adjust> is pressed to select an item so that the same menu is redisplayed.

### Additions and amendments to !RunImage

To incorporate the menus into the application which we created in Part 1 you will need to delete lines 40, 50 from that published in May and add/amend the following lines:

```
86      WHEN 6 : PROCmouse_click
              (wimp_block%!8)
89      WHEN 9 : PROCmenu_select
205 DIM buffer 40
225 task_id% = FNinitialise_wimp
              ("Ultimate utility")
230 bar_icon% = FNcreate_bar_icon
              ("!ultimate",bar_icon_left)
235 icon_menu% = FNcreate_menu
              ("Ultimate,Info%,Options,Quit")
240 options_menu% = FNcreate_menu
              ("Options,Copy,Count,Wipe")
245 copy_options_menu%=FNcreate_menu
              ("Copy,Access,Confirm,Delete,
              Force,Look,Newer,Prompt,Quick,
              Recurse,Stamp,Structure,
              Verbose$,Default")
250 count_options_menu% = FNcreate_menu
              menu("Count,Confirm,Recurse,
              Verbose$,Default")
255 wipe_options_menu%=FNcreate_menu
              ("Wipe,Confirm,Force,Recurse,
              Verbose$,Default")
260 PROCmenu_attach(icon_menu%,2,
              options_menu%)
265 PROCmenu_attach(options_menu%,1,
              copy_options_menu%)
270 PROCmenu_attach(options_menu%,2,
              count_options_menu%)
275 PROCmenu_attach(options_menu%,3,
              wipe_options_menu%)
400 DEF PROCmouse_click(click%)
```



```

410 CASE click% OF
420   WHEN menu_button :
430     IF wimp_block%!!2 = icon_bar
440       PROCupdate_menus
450       PROCshow_menu(icon_menu%,
         !wimp_block%-64,FNmenu_height
         (icon_menu%))
460   ENDIF
470 ENDCASE
480 ENDPROC
500 DEF PROCmenu_select
510   LOCAL adjust%,menu_text$
520   adjust% = FNadjust_pressed
530   menu_text$ = FNdecode_menu
540   CASE FNfield(menu_text$,".") OF
550     WHEN "Quit" : finished% = TRUE
560     WHEN "Options" :
570       CASE FNfield(menu_text$,".") OF
580         WHEN "Copy" :
590           PROCset_options(menu_text$,
             "AccConDelForLooNewProQui
             RecStaStrVer","ACDFLNQRSTV"
             ,"Copy", copy_options_menu%
             ,"A C `D `F `L `N `P `Q
             `R `S `T V")
600         WHEN "Count" :
610           PROCset_options(menu_text$,
             "ConRecVer","CRV","Count",
             count_options_menu%,
             "`C R `V")
620         WHEN "Wipe" :
630           PROCset_options(menu_text$,
             "ConForRecVer","CFRV","Wipe"
             ,wipe_options_menu%,
             "`C `F `R V")
640       ENDCASE
650     ENDCASE
660   IF (adjust% AND NOT finished%)
670     THEN PROCreshow_menu
680   DEF PROCset_options(option$,
690     options$,sys_options$,system$
700     ,menu$,default$)
710   LOCAL count,option,set,set$
720   option = INSTR(options$,LEFT$
730     (option$,3))
740   IF option > 0 THEN
750     PROCmenu_tick_toggle(menu%,
760       (option DIV 3) + 1)
770   set$ = ""
780   FOR count = 1 TO (LEN(options$)
790     DIV 3)
800     set=FNmenu_ticked(menu%,count)
810     IF set THEN set$ += " " ELSE
820       set$ += " "
830   ENDIF
840   IF option$ = "Default" THEN
850     OSCLI "SET " + system$ +
860       "$Options " + default$
870   PROCupdate_menus
880   ENDIF
890   ENDPROC
900 DEF PROCupdate_menus
910   PROCset_menu_ticks (copy_
920     options_menu%,"Copy",
930     "ACDFLNQRSTV")
940   PROCset_menu_ticks(count_
950     options_menu%,"Count","CRV")
960   PROCset_menu_ticks(wipe_
970     options_menu%,"Wipe","CFRV")
980   ENDPROC
990 DEF PROCset_menu_ticks(menu%,
1000   system$,valid$)
1010   LOCAL option,option$,
1020     tick_value%
1030   option$ = FNread_system_
1040     variable(system$ + "$Options"
1050     ,valid$ + "")
1060   WHILE option$ <> ""
1070     IF LEFT$(option$,1) = "-" THEN
1080       tick_value% = FALSE
1090     option$ = RIGHT$(option$,
1100       LEN(option$) - 1)
1110   ELSE
1120     tick_value% = TRUE
1130   ENDIF
1140   option = INSTR(valid$,LEFT$
1150     (option$,1))
1160   IF option > 0 THEN
1170     PROCset_menu_tick(menu%,
1180       option,tick_value%)
1190   option$ = RIGHT$(option$,
1200     LEN(option$) - 1)
1210   ENDWHILE
1220   ENDPROC

```

```

1200 DEF FNread_system_variable
        (variable$,match$)
1210 LOCAL option$,bytes,loop
1220 option$ = ""
1230 SYS "OS_ReadVarVal",variable$
        ,buffer,40,0 TO ,,bytes
1240 buffer?(bytes + 1) = 13
1250 FOR loop = 0 TO bytes
1260 IF INSTR(match$,CHR$
        (buffer?loop)) > 0 THEN option$
        += CHR$(buffer?loop)
1270 NEXT loop
1280 =option$

```

### Additions and amendments to Wimplib

To add the menu routines to the Wimplib program the following additions/amendments should be made to the program published in Part 1.

```

25 LOCAL task_id%,version%
30 DIM wimp_block% 512,menu_block%
        &1000,data_block% 64
35 menu_free% = menu_block%
61 adjust_button=1 : menu_button=2
62 select_button=4 : icon_bar = -2
65 current_menu% = -1
66 menu_x% = 0 : menu_y% = 0
105 LOCAL icon%
140 wimp_block%!12 = 68
160 wimp_block%!20 = &3002
300 DEF FNcreate_menu(menu$)
310 LOCAL menu_ptr%,width%,title$
320 menu_ptr% = menu_free%
330 title$ = FNfield(menu$,"")
340 IF LEN(title$) > 12 THEN
350 $(menu_ptr%) = LEFT$(title$,12)
360 width% = 12
370 ELSE
380 $(menu_ptr%) = title$
390 width% = LEN(title$)
400 ENDIF
410 menu_ptr?!12=7 : menu_ptr?!13=2
420 menu_ptr?!14=7 : menu_ptr?!15=0
430 menu_ptr?!20=44 : menu_ptr?!24=0
440 menu_item_ptr% = menu_ptr% + 4
450 WHILE menu$ <> ""
460 menu_item_ptr% += 24
470 menu_item$ = FNfield(menu$,"")
480 !menu_item_ptr% = 0
490 menu_item_ptr%!4 = -1
500 menu_item_ptr%!8 = &7000021
510 WHILE INSTR("#$%^",RIGHT$(menu_
        item$)) > 0

```

```

520 CASE RIGHT$(menu_item$) OF
530 WHEN "#" : ?menu_item_ptr% =
        ?menu_item_ptr% OR %00000001
540 WHEN "$" : ?menu_item_ptr% =
        ?menu_item_ptr% OR %00000010
550 WHEN "%" : menu_item_ptr?!10
        = menu_item_ptr?!10 OR
        %01000000
560 WHEN "^" : ?menu_item_ptr% =
        ?menu_item_ptr% OR %00000100
570 ENDCASE
580 menu_item$ = LEFT$(menu_item$)
590 ENDWHILE
600 IF LEN(menu_item$) > width%
        THEN width% = LEN(menu_item$)
610 $(menu_item_ptr%+12) =
        menu_item$ + CHR$(0)
620 ENDWHILE
630 ?menu_item_ptr% =
        ?menu_item_ptr% OR %10000000
640 menu_ptr?!16 = (width%*8+6)*2
650 menu_free% = menu_item_ptr% + 24
660 =menu_ptr%
700 DEF PROCshow_menu(menu$,x%,y%)
710 current_menu% = menu%
720 menu_x% = x%
730 menu_y% = y%
740 SYS "Wimp_CreateMenu",,menu$,x%
        ,y%
750 ENDPROC
800 DEF PROCreshow_menu
810 PROCshow_menu(current_menu%,
        menu_x%,menu_y%)
820 ENDPROC
900 DEF FNdecode_menu
910 LOCAL menu_text$
920 SYS "Wimp_DecodeMenu",, current_
        menu%,wimp_block%, STRING$
        (200," ") TO ,,menu_text$
930 =menu_text$
1000 DEF PROCmenu_attach(menu%,
        position%,attachment%)
1010 menu%!(28 + 24 * (position%-1)
        + 4) = attachment%
1020 ENDPROC
1100 DEF FNmenu_height(menu%)
1110 LOCAL height%,menu_item_ptr%
1120 menu_item_ptr% = menu% + 28
1130 height% = 0
1140 WHILE (?menu_item_ptr% AND
        %10000000) = 0

```



```

1150 menu_item_ptr% += 24
1160 height% += 1
1170 ENDWHILE
1180 =96 + (44 * (height% + 1))
1200 DEF PROCmenu_tick_toggle
      (menu%,position%)
1210 menu%?(28 + 24 * (position%-1))
      = menu%?(28 + 24 *
      (position% - 1)) EOR 1
1220 ENDPROC
1300 DEF PROCset_menu_tick(menu%,
      position%,ticked%)
1310 IF ticked% THEN
1320 menu%?(28 + 24 * (position% -
      1)) = menu%?(28 + 24 *
      (position% - 1)) OR 1
1330 ELSE
1340 menu%?(28 + 24 * (position% -
      1)) = menu%?(28 + 24 *
      (position% - 1)) AND %111111110
1350 ENDIF
1360 ENDPROC
1400 DEF FNmenu_ticked(menu%,
      position%)
1410 LOCAL result%
1420 IF (menu%?(28 + 24 * (position%
      - 1)) AND 1) > 0 THEN
1430 result% = TRUE
1440 ELSE
1450 result% = FALSE
1460 ENDIF
1470 =result%
1500 DEF FNadjust_pressed
1510 SYS "Wimp_GetPointerInfo",,
      data_block%
1520 = (data_block%!8 AND 1)
1600 DEF FNfield(RETURN menu$,
      separator%)
1610 LOCAL result$
1620 result$ = LEFT$(menu$,
      INSTR(menu$+separator$,
      separator%) - 1)
1630 menu$ = RIGHT$(menu$, LEN(
      menu$) - LEN(result$) - 1)
1640=result$

```

### What next?

Next month, I hope to look at template files and how to incorporate a simple window into the application. It would be beneficial if you got some practice at using the !FormEd (On Shareware 20, £3, or as the more developed WIMP Template Editor, £8) application released by Acorn to create template files. You could, for example, make a copy of the templates used by !Edit and have a go at changing those!

As before, if anyone has any ideas, problems, suggestions (or offers of vast sums of money) I can be contacted either through Archive or at 43, Kingfisher Walk, Ash, Aldershot, Hampshire GU12 6RF. **A**

## Using FontEd

### Robert Christmas

FontEd is an outline font editor produced by Acorn. It is public domain (Shareware 7). There is no printed documentation but the application includes a !Help and a ReadMe file.

The ReadMe file says that FontEd is 'only really useful for exporting characters to Draw' which understates the powers of this valuable program. In fact, it can also be used to examine outline fonts, to alter characters, or to create new characters.

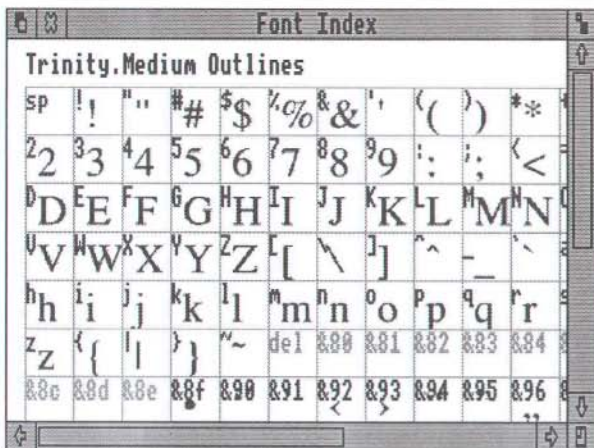
### Examining fonts

FontEd will display all the characters in an outline font. First load FontEd; then look inside a !Fonts directory (you must use <shift double-

click> to open an application directory like !Fonts), and work down through the directories until you find an outline file (easy to recognise because it is called 'Outlines'). Drag the outlines file onto the FontEd icon. A window with a table showing all the characters in the font should appear (the 'Font Index Window' – see overleaf). To examine a character in more detail double-click <adjust> on the character – this produces the 'full' window. If you double-click <select> the 'skeleton' window will open and you will see how the letter is constructed.

### Saving a character in Draw format

Each character is defined as a series of lines and curves, and you can export theses line and curves as a draw object. Once the character has been



saved in this form you can use !Draw to rotate it, alter its fill colour or outline colour or, with !DrawBender or !Poster, it can be bent or distorted. To save a character, drag it on to a filer window. You do not get a proper save window – the character is always saved as 'DrawFile' so be careful not to overwrite something important.

### Creating/altering characters

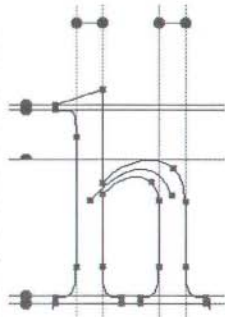
It is not unusual to find that a font lacks a character you require. Some PD fonts omit less common punctuation marks. You might wish to create an additional character, a foreign currency symbol, a trade mark or perhaps just an open box to make creating forms simpler. Many magazines use a special character to mark the end of each story (for example Archive uses 'A').

To produce your own character, first print out the FontEd !Help file and read it. The text has a rather austere style but it does contain all you need to know to operate the program. It is worth reading carefully because the mouse buttons are given about six functions depending on the context.

If you are creating a new character, you must first decide which slot in the font index it will occupy. Now find the character which has a shape most like your new character. For punctuation a full stop, a colon or an inverted comma might be suitable, or for more geometrical shapes you might try '+' or '='. Drag this character into the slot where your new character will go. The shape

may be some help creating your new character but, more importantly, you will transfer the scaffolding which will help you to make sure that your new character lines up with the others. Now you can double click <select> on the new character to open the skeleton window.

The light blue lines are scaffolding; as well as ensuring that the characters line up, they are used when the font manager

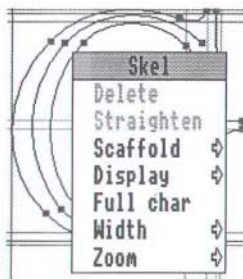


converts the outline to a bit map font. For our purposes, it will be sufficient to treat them like guide lines.

Look for a red horizontal line with a cross at each end. This is the base line, only descenders go far below this line. The crosses at each end control the width of the character. The left hand edge of the character should fall on, or just to the right of the left hand cross. The right hand cross determines the space which the character occupies, so the right hand edge of the character may be well inside the cross to allow for some space before the next character. You may be unlucky enough to choose a character which seems to have just one red cross and no line.

This means that the character has zero width – use the menu for the skeleton window to increase the width.

The outline for the character will be shown in black with dark green squares marking the control points. There may also be skeleton lines within the character which are shown in the same way.





When you edit a character in the skeleton window, it is important to remember that there are two editing 'modes', one to edit scaffolding, the other to edit outlines. If a scaffolding line is selected (highlighted in red) you can move scaffolding lines and link points to lines but you can not move the control points to alter the outline. You can change from editing outlines to editing scaffolding just by clicking on a 'control blob' (the light green circles), but it is not as easy to get back to editing outlines. You must point to a blank area where there are no lines and click <shift-select>.

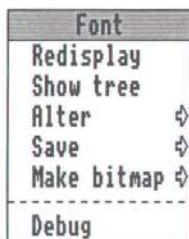
You need to outline the shape you require. It may be possible to do this just by dragging a few points with <adjust>. If that is all you need, breath a sigh of relief make the adjustments and save the font from the font index window in the usual way.

If you have to get involved in more strenuous editing, be careful because just clicking <select> for too long is enough to create a new line segment. Any drag with <select> will create a new line. You can select a line segment with <adjust> which will allow you to delete unwanted lines using the skeleton menu. If you create a line segment which has an end near the loose end (1-node) of another segment, the lines will automatically be linked.

If you select a straight line, two 'control points' will appear on the line which you can drag to make a curve. You can turn curves into lines by using the 'straighten' option on the skeleton menu.

The program automatically decides which areas to fill. It treats all the segments as a single path and uses the same "even-odd" rule as Draw.

The font index window is updated as you edit the skeleton window, so when you have finished editing you just save your work from the index window.



## Reservations

It does not seem unreasonable to make modifications for your own use, but you should think carefully before distributing a modified font. It is of course illegal to take a copyright font, modify a few characters and the pass it off as your own. Public domain fonts are not protected in the same way and it might seem reasonable to pass them on with a few changes. However each font is someone's personal creation, on which he/she has spent many hours. At the least his/her reputation is threatened by the addition of a few amateur blobs.

It is just about possible to create a font from scratch using FontEd but I would not recommend it. It would be hard work using FontEd.

In the ReadMe file there is a reference to 'a complete editor ... available in due course', but even with a better editor you should still hesitate. If you are already interested in font design, you may wish to experiment, but if all you want is a few more fonts then resist the impulse to do it yourself. Archimedes owners have available a beautiful range of professionally designed fonts at very reasonable prices. Many of these are copies of fonts created for publishing by people who have devoted their lives to designing good quality fonts. Learning to operate an editing program is not even beginning to master this art.

## Font names – a warning

You cannot change the name of a font simply by renaming its directory. The name is also stored inside each file and it is this copy which is used by the font manager. If you try to use a renamed font then every time it has to be redrawn on the screen, the font manager will examine the fonts cached in memory, it will fail to find a font with the right name so it will load a copy from disk. The result is that redrawing the font will take ages and your font cache, be it ever so big, will fill up in no time at all. To rename the font, you must also change the name inside each outline file, each IntMetrics file, and, for all I know each Bitmap file if one exists. The easiest way is to use FontFix, on Shareware 38 which will correct font names automatically. **A**

# Protext 5 Wordprocessor

## Peter Jennings

New word processors for the Archimedes have been disappointingly few, compared with the DTP programs which have appeared in the last few years. So, the decision by Amnor to produce an Archimedes version of their successful Protext word processor was very welcome.

Protext, which has been under continuous development since 1984, is described as a fully integrated word processing system, comprising word processor, spelling checker, mail merge and file conversion and sorting programs. The latest version, Protext 5, gives Archimedes owners the chance to join users of IBMs and compatibles, Atari's and Amigas. So, does the Archimedes version live up to Protext's reputation on the other machines?

Protext arrives looking reassuringly business-like in a large, impressive, box containing three unprotected discs and a mass of documentation including three manuals. The main one of these is nearly an inch thick with a daunting 380 pages. The other two are a 48-page tutorial guide and 22 pages on printer drivers.

The size of the main manual may deter some inexperienced computer users but the tutorial offers an easy guide into the program and the bigger book can be put aside for later reference. There is also on-screen help and anyone familiar with word processing will be able to make an start before opening either book. Of course, the main manual will soon be found essential for discovering the rich variety of features the program contains.

## Compatibility between machines

Protext has been designed to work in the same way for all the machines it supports and there is only one version of each manual, with machine-specific paragraphs where necessary. If you use, say, a PC version at work, you can move to your Archimedes at home with little if any adjustment and can even work on the same files and possibly with the same discs on both. When I tried Protext for the first time, I was surprised for a moment to

find the delete key was deleting the character at the cursor instead of the one before it. Having used a PC, I soon realised that the backspace key (the left-pointing arrow next to the insert key) was the one to use and, of course, it was mentioned in the manuals.

## Customising

One of the great strengths of Protext is the extent to which it can be customised. Any keys except shift and lock can easily be changed to suit the individual user. So I quickly had the delete and copy keys set to backward and forward deleting respectively, as I prefer.

The keyboard comes configured for US English. This is correct for the Archimedes so do not make the mistake of changing it to UK English or you will find that some of the keys are not behaving as expected.

At present, the program does not use the Archimedes WIMP system or multi-tasking, although a RISC-OS version is promised for later this year. Surprisingly, it does not even have its own icons and Protext files appear on the desktop with blank squares. It does, however, return correctly to the desktop when you quit the program.

The actual program is on just one of the three discs. The other two hold a massive set of dictionaries and the printer drivers. Everything is easily copied into a single directory on hard disc and will all load by clicking on the application icon.

As well as spell-checking, the dictionaries can suggest a range of likely alternatives to misspelt or mistyped words, list anagrams and find word patterns. Other dictionaries are available for foreign languages. The keyboard can be configured for ten different national layouts and there is an enormous range of accents and characters for nearly 30 languages including Welsh, Esperanto, Lithuanian, Slovene and Flemish, with more to come.

The latest version, 5.08, has cleared up some odd bugs I found in an earlier one but there is still a quirk when the program is loaded. It starts up



with some strange washed-out colours until the screen mode is changed, or even reset to the same mode, when the configured colours appear. In practice, this is no problem as the program can be configured to do it automatically when starting up.

### **Pull down menus**

At the top of the screen there is a ruler which can include tab marks, a decimal point to line up any figures entered and a 'C' to centre the text from anywhere in the line. Above that are two lines of information, including the name and size of the current file, the cursor position and selected options such as insert or overwrite mode, whether markers are set and the caps lock condition. There is also an unobtrusive digital clock (which can be switched off if not wanted) and a reminder that <F3> produces a menu bar. This appears as a line of headings with pull down menus similar to Inter-Word or the early versions of PipeDream. Escape toggles between editing and a command line, set up in a window in the lower third of the screen, allowing commands to be given to Protext or to the Archimedes operating system.

Although the function keys are used, no function key strip is provided. The commands are all duplicated in the menus or with key strokes but the function keys are usually quicker to use. One exception is to press <adjust>, instead of <F3>, to call up the menu bar.

### **Line drawing**

Two of the function keys provide a novel facility. Pressing <ctrl-f7> enables <alt> plus any of the four cursor arrow keys to draw a line in the arrow's direction. <Ctrl-f8> allows the choice of any character (such as a full stop or a dash) to be used for lines drawn in the same way.

### **Basic features**

Protext 5 is very fast and powerful, with all the facilities expected in a major word processor and some good unexpected features. They include automatic reformatting, spell checking as you type or later, auto-indent, find and replace, footnotes and indices, justification of text to make a straight right-hand edge, word count and automatic saving at preset intervals, all optional. There is background printing from a buffer set up

in memory, so that you can carry on with a new document while your finished work is printed out, and a backup is made of the old file when you save a new version. Up to 36 documents can be held in memory and displayed on screen separately or two at a time, allowing text to be moved between them. Two files shown on a split screen can even be locked together to scroll simultaneously, making it simple to compare similar documents. Roman numerals can be used.

### **Sophisticated features**

The sophistication of some of its features is often a delight. You can, for example, delete single letters or words, either forwards or backwards, and delete to the start or end of a line and to the start or end of a sentence. Deleting a word will, usefully, leave any punctuation mark which follows it. There are keystrokes to produce half and quarter signs and to swap adjacent letters which may have been mistyped. Place markers can be inserted into a text so that you can move quickly between sections, perhaps to make later additions. Directories which do not already exist are created automatically when saving. Rows or columns of figures can be added up and the total printed into the text if wanted, simply by clicking on the figures to be included. Other calculations can be made, enabling invoices to be typed with VAT added and totalled. The facilities offered for mail merging take 40 pages of the manual to detail.

Macro files can be used to program the function keys and the keys for any letters of the alphabet, to store text or codes. Pressing the appropriate function key or <alt> and the chosen letter then has the same effect as typing in the programmed characters. So, for example, you can have <shift-alt-f> programmed to add "Yours faithfully," at the end of your letters and <shift-alt-t> for "Yours truly," and so on, each followed by a number of blank lines and your name. The addition of the shift key is not essential but worth using as there are some useful commands already programmed for some alt and letter combinations, such as <alt-d> to insert the date and <alt-t> for the time. There are also exec files, which are typed in as text, containing commands and codes.

One can be run automatically when the program starts, to carry out any desired instructions, such as changing mode and directory and turning off caps lock (using \*FX202,48). Templates can be saved containing letter headings and page layouts, with stored commands for the printer in Protext's own programming language.

Printing is carried out using the printer font, including bold, italic and underline styles which are shown on screen and also have optional changes of colour. Text can be printed in columns but not shown on the screen in this way. External fonts can not be loaded and it is necessary to use one of the 48 printer drivers provided. The printer driver manual lists suitable drivers for nearly 150 printers. There is a choice of drivers for Epson compatibles, shown in order of features to make it easy to find the best one for your printer if it is not listed by name.

Additional programs are provided to customise the Protext configuration, to convert between different file types and for file sorting. The latter can be used with other programs and is particularly useful. One of its options is to sort by the last word on a line so that files of names and addresses can be relisted alphabetically by surnames. There is a problem with the present version making it sometimes necessary to quit and reload Protext to use the convert and sort programs.

### Should you buy it?

The advice when choosing a word processor (or any other program) must be to check that it does what you want. Protext is not a DTP program and anyone who needs to use a variety of fonts or lay out pages of text and illustrations would find a DTP package more suitable. It is not fully wysiwyg (what you see is what you get) and does not yet multi-task or use RISC-OS windows. Otherwise, it seems to have everything anyone could want from a word processor plus a variety of less-expected but very useful features.

I think the promised RISC-OS version could make it a real winner for the Archimedes but should you buy one now? If you can afford to wait you may prefer to go for the RISC-OS Protext later this year but if you need a word processor now, and you like the sound of Protext, it is still worth getting the present version. The cost, including the new rate of VAT, is £152.75 (£138 from Archive). Armor say the RISC-OS upgrade may be issued on its own at a nominal price or could come as part of a general upgrade costing less than £30. **A**

### Contact Box

• **Lancashire Archimedes Group** – Anybody interested in forming an Archimedes user group please contact Ian Rhodes, 864 Manchester Road, Rochdale OL11 2SP (0706-31810). **A**

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